経済産業省委託
平成１９年度産業技術研究開発委託費
（基準認証研究開発事業：情報分野の国際競争力強化の標準化調査研究）

ソフトウェアの評価技術の標準化に関する調査研究

成 果 報 告 書

平成２０年３月

財団法人　日本規格協会
情報技術標準化研究センター

この調査研究は、経済産業省からの委託で実施したものの成果である。

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1　はじめに

あらゆる分野で構造改革や組織改革が本格化する中で、ソフトウェアの利用局面は拡大の一途をたどっており、社会基盤自体のソフトウェア依存度が高まるだけでなく、ソフトウェアに対する要求も多岐に分かれてきている。こうした環境下において、ソフトウェア産業は質の高いソフトウェアを供給することにより、社会システム全体の信頼性・安全性の確保に貢献することを求められている。

ところで、こうしたソフトウェアは、品質面では高品質で信頼性が高く、システムダウンや障害を発生させないことは当然であるが、性能・生産性という面での向上も求められている。

一般に利用者が直接操作するアプリケーションソフトウェアでは、使用性を考慮し、専門家でなくても容易に操作方法が理解でき、使用できるものが必要となってきている。更には、必要なときに、必要な人に、適切な操作方法の説明がリアルタイムでできることも必要となってきている。こうした高品質で使いやすいソフトウェアを効率よく実現するためには、発注者と開発者とがお互いに同じステージに立ち、共通の言葉を使って、受注活動から開発・納入・運用・保守まで全工程でお互いに納得できる基準に従って、協力し合うことが重要である。

さらに、ソフトウェアの開発ということに着目すると、開発作業の国際分業化がますます進んできている中で、開発作業を円滑に、かつ効率的に進めるためには、基盤となる開発モデルを参照しながら開発作業を進める必要がある。また、そこで使用される開発環境・ツールなどの共通化も必要となってくる。

そうした中、わが国のソフトウェア産業は、国内産業の基幹産業としてだけではなく国際市場で通用する産業競争力を養っていくことが重要となってきている。ここでいう、ソフトウェアとは、ビジネス分野で使用されている業務アプリケーションやパッケージソフトだけでなく、家電品、自動車、携帯電話などに組み込まれているソフトウェア（組込みソフト）も含んでいる。

本調査研究委員会では、ソフトウェアエンジニアリング分野に関する調査研究を続けており、ISO/IEC JTC1/SC7 と密接な関係を持って活動しており、そのカバーする範囲は広範囲に及んでいる。例えば、ソフトウェアシステムの文書化、ツールと環境、ソフトウェア製品の品質評価と測定、ライフサイクルプロセス管理、ソフトウェアの完全性（インテグリティ）、ソフトウェアプロセス評価、機能的規模測定法（ファンクションポイント法など）、品質管理、モデリング言語、構成管理などがある。

今年度は、これらの中から、①ソフトウェア製品の品質評価と測定：ソフトウェア製品の品質改善に関する委員会、②ソフトウェアプロセス評価：ソフトウェアプロセス評価委員会、③ソフトウェアシステムの文書化：オンラインドキュメンテーション委員会　について活動を行った。

2　委員会名簿

本委員会

委員長	山本　喜一	慶應義塾大学
委　員	東　　基衛	早稲田大学
委　員	和泉　章	経済産業省産業技術環境局情報電子標準化推進室
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事務局	田村　由佳里	財団法人日本規格協会情報技術標準化研究センター

WG1：ソフトウェア製品の品質評価委員会：SPE

主　査	東　　基衛	早稲田大学
幹　事	込山　俊博	日本電気株式会社
委　員	池田　幸男	沖電気工業株式会社
委　員	江崎　和博	株式会社荏原製作所
委　員	古賀　恵子	株式会社日立製作所
委　員	坂本　健一	株式会社 NTT データ
委　員	田中　秀明	コンサルタント
委　員	谷津　行穂	日本アイ・ビー・エム株式会社
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事務局	田村　由佳里	財団法人日本規格協会情報技術標準化研究センター

WG2：ソフトウェアプロセス評価委員会：SPA

主　　査	小川　清	名古屋市工業研究所
幹　　事	小林　正幸	三菱電機株式会社
委　　員	足立　久美	株式会社デンソー
委　　員	板橋　吉徳	松下電器産業株式会社
委　　員	大川　鉄太郎	株式会社日本ユニシス
委　　員	岡崎　靖子	日本アイ・ビー・エム株式会社
委　　員	尾形　俊彦	みずほ情報総研株式会社
委　　員	小川　俶子	株式会社バンク・オブ・クリエティビティ
委　　員	小野　環樹	沖電気工業株式会社
委　　員	北野　敏明	新日鉄ソリューションズ株式会社
委　　員	小泉　浩	マイクロソフト株式会社
委　　員	込山　俊博	日本電気株式会社
委　　員	逆井　義文	NTT ソフトウェア株式会社
委　　員	柴原　英明	株式会社 NTT データ
委　　員	新谷　勝利	独立行政法人情報処理機構
委　　員	平山　雅之	株式会社東芝
委　　員	福地　豊	株式会社日立製作所
委　　員	伏見　諭	株式会社情報数理研究所
委　　員	堀田　勝美	株式会社コンピータジャパン
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事　務　局	田村　由佳里	財団法人日本規格協会情報技術標準化研究センター

WG3：オンラインドキュメンテーション委員会：OLD

主　　査	山本　喜一	慶應義塾大学
幹　　事	高瀬　明	日科情報株式会社
委　　員	片岡　克尚	日本アイ・ビー・エム株式会社
委　　員	米谷　尚久	株式会社日立製作所
委　　員	石橋　浩子	シスコシステムズ合同会社
経済産業省	小林　秀司	経済産業省産業技術環境局情報電子標準化推進室
事　務　局	山形　薫	財団法人日本規格協会情報技術標準化研究センター
事　務　局	田村　由佳里	財団法人日本規格協会情報技術標準化研究センター

3　各委員会の活動報告

3.1　本委員会

本委員会は、ソフトウェア技術に関して総合的に検討するものとし、「基準認証研究開発事業：情報分野の国際競争力強化の標準化調査研究」及び「社会ニーズ対応型基準創成調査研究事業（分野横断的技術分野）」の二つの調査研究委員会を統合する委員会として位置づけ、合同で開催している。それぞれの事業で実施している委員会は、次のとおりである。

1）基準認証研究開発事業：情報分野の国際競争力強化の標準化調査研究

：ソフトウェアの評価技術の標準化に関する調査研究委員会

①WG1：ソフトウェア製品の品質評価と測定：ソフトウェア製品の品質評価（SPE）委員会

②WG2:ソフトウェアプロセス評価：ソフトウェアプロセス評価（SPA）委員会

③WG3：ソフトウェアシステムの文書化：オンラインドキュメンテーション（OLD）委員会

2）社会ニーズ対応型基準創成調査研究事業（分野横断的技術分野）

：ソフトウェア製品の生産性向上に関する調査研究委員会

①WG1：機能規模測定法（FSM）委員会

②WG2：ソフトウェア測定プロセス（SMP）委員会

③WG3：ソフトウェア技術環境サービス（SEES）委員会

④WG4：システムライフサイクルプロセス（SLCP）委員会

3.1.1　委員会実施状況

今年度は、本委員会及びWGにおいて、合計34回の委員会及びWGを開催した。

本委員会	2回
WG1：ソフトウェア製品の品質評価委員会	12回
WG2：ソフトウェアプロセス評価委員会	11回
WG3：オンラインドキュメンテーション委員会	9回

3.2　WG1：ソフトウェア製品の品質評価委員会：SPE

3.2.1　背景

ソフトウェア製品の評価に関する国際規格は、1985 年に作業を開始し、ISO/IEC 9126: Software quality characteristics and metrics(JIS X 0129-1 及び TR X 0111-2、3、4)シリーズ及び ISO/IEC 14598: Evaluation of software products（JIS X 0133：ソフトウェア製品の評価）シリーズを主要部分とし、いくつかの関連規格から構成されている。これらの規格は、日本、ブラジル、フランス、ドイツなどの非英語圏の国々でもその国の国内規格として制定され、活用されてきた。

しかしながら、これらに規格は、開始から 10 年以上をかけて完成されたものであるため、全体として見たとき、いくつかの問題点があると考えられた。その大きなものは、次の 3 点である。

－　規格全体の構造が明確になっていないし。使用のための手引きがない。

－　測定法（metrics）や指標（indicator）が完全でない。

－　品質要求事項を規定した規格がない。

そこで、こうした問題点を解消するため、日本からの提案により、新たなソフトウェア製品の品質評価及び品質要求事項に関する規格群に再構成することになった。

ソフトウェア製品の品質規格は国内各社の品質評価方法を基に国際提案しており、コンビナ、セクレタリ、総合プロジェクトエディタ、プロジェクトエディタを日本から出している日本提案の規格である。ソフトウェア製品の品質要求及び評価について、全体的に見直しを行い、既存規格も含めて SQuaRE(Software product Quality Requirements and Evaluation) シリーズという規格体系にすることを日本から提案し、承認され、必要な規格を国内意見を集約しつつ、作成・提案している。

3.2.2　ソフトウェア製品の品質要求及び評価規格（SQuaRE）

<table>
<tr><td rowspan="3">2503n
品質要求部門</td><td>2501n 品質モデル部門</td><td rowspan="3">2504n
品質評価部門</td></tr>
<tr><td>2500n 品質管理部門</td></tr>
<tr><td>2502n 品質測定部門</td></tr>
<tr><td colspan="3">25051～25099　SQuaRE拡張部門</td></tr>
</table>

図 1　SQuaRE シリーズの構成

SQuaRE は、**図 1** に示すような構成になっており、合計 19 の規格の開発を予定している。それぞれの概略は次のとおりである。

1）**2500n －　品質管理部門**. ：2規格

SQuaREシリーズの他の規格から参照される共通モデル、用語及び定義を規定する。さらに、ソフトウェア製品の品質要求の仕様化及び評価の管理に責任のある支援機能のための要求事項及び手引を提供する。

・ISO/IEC 25000 SQuaRE －　Guide to SQuaRE　　IS 発行済み（2005/8）

・ISO/IEC 25001 SQuaRE - Planning and management　　IS 発行済み (2007/2)

2) 2501n - 品質モデル部門. : 2規格

ソフトウェア内部品質、ソフトウェア外部品質及び利用時の品質のための品質特性を含む詳細な品質モデルを規定する。さらに、内部及び外部ソフトウェア品質特性は品質副特性に分解される。また、品質モデルの実際的な利用のためのガイドも提供する。

・ISO/IEC 25010 SQuaRE - Quality model　　1stCD

・ISO/IEC 25012 SQuaRE - Data quality model　　FCD

3) 2502n - 品質測定法部門：5規格

ソフトウェア製品の品質測定法の参照モデル、品質測定法の定義及び適用のための実際的な手引を規定する。提供する測定法は内部ソフトウェア品質、外部ソフトウェア品質及び利用時のソフトウェア品質に適用できる。さらに、品質測定法のための基礎となる品質測定要素を定義し、提供する。

・ISO/IEC 25020 SQuaRE - Measurement reference model and guide　　IS 発行済み (2007/5)

・ISO/IEC TR 25021 SQuaRE - Quality Measure Elements　　TR 発行済み (2007/10)、revision : WD

・ISO/IEC 25022 SQuaRE - Measurement of internal quality　　WD

・ISO/IEC 25023 SQuaRE - Measurement of external quality　　WD

・ISO/IEC 25024 SQuaRE - Measurement of quality in use　　WD

4) 2503n - 品質要求部門：1規格

品質要求の仕様化を支援するための規定を提供する。品質要求は、ソフトウェア製品の品質要求の導出又は評価プロセスのための入力として利用することができる。要求定義プロセスは、JIS X 0170 (システムライフサイクルプロセス) に定義されたテクニカルプロセスに対応している。

・ISO/IEC 25030 SQuaRE - Quality requirements　　IS 発行済み (2007/6)

5) 2504n - 品質評価部門：6規格

評価者、取得者または開発者によるソフトウェア製品評価のための要求事項、推奨事項及びガイドラインを用意する。また、測定の文書化のための支援として、評価モジュールも提供する。

・ISO/IEC 25040 SQuaRE - Quality evaluation overview and guide　　1stCD

・ISO/IEC 25041 SQuaRE - Evaluation Model　　未着手

・ISO/IEC 25042 SQuaRE - Evaluation process for developers　　未着手

・ISO/IEC 25043 SQuaRE - Evaluation process for acquirers　　未着手

・ISO/IEC 25044 SQuaRE - Evaluation process for evaluators　　未着手

・ISO/IEC 25045 SQuaRE - Evaluation Module for Recoverability　　NP

6) 25051～25099　SQuaRE拡張部門：3規格

上記の各部門対応の規格を補足するためのもので、共通的に適用できるものを提供する。

・ISO/IEC 25051 SQuaRE - Requirements for quality of Commercial Off-The-Shelf(COTS) software product and instructions for testing　　IS 発行済み (2006/4)

・ISO/IEC 25062 SQuaRE - Common Industry Format(CIF) for Usability Test Reports　　IS 発行済み (2006/4)

・ISO/IEC 25060 SQuaRE - General framework for usability-related information　　WD

これらの国際規格は、随時 JIS 化を図っていく予定である。

これらの国際規格について、日本は、SQuaRE 全体の総合プロジェクトエディタ、及び 25001、25022、25023、25024、25030、25045 のエディタ又はコエディタを務めている。

3.2.3 活動概要

今年度の活動経緯は以下のとおりである。

第 1 回　2007 年 04 月 13 日（金）
第 2 回　2007 年 05 月 11 日（金）
第 3 回　2007 年 06 月 08 日（金）
第 4 回　2007 年 07 月 06 日（金）
第 5 回　2007 年 08 月 01 日（水）
第 6 回　2007 年 09 月 07 日（金）
第 7 回　2007 年 09 月 28 日（金）
第 8 回　2007 年 10 月 26 日（金）
第 9 回　2007 年 12 月 07 日（金）
第 10 回　2008 年 01 月 11 日（金）
第 11 回　2008 年 02 月 01 日（金）
第 12 回　2008 年 03 月 07 日（金）

3.2.4 活動成果

3.2.2 で記載した国際規格の作成支援をしており、現在の状況は次のとおりである。

●国際規格原案の状況

－IS、TR になったもの（7 件）

ISO/IEC 25000、ISO/IEC 25001、ISO/IEC 25020、ISO/IEC TR 25021、ISO/IEC 25030、ISO/IEC 25051、ISO/IEC 25062

－FCD、CD になったもの(3 件)

ISO/IEC CD 25010、ISO/IEC FCD 25012、ISO/IEC CD 25040

－WD になったもの(6 件)

ISO/IEC WD 25021、ISO/IEC WD 25022、ISO/IEC WD 25023、ISO/IEC WD 25024、ISO/IEC WD 25045、ISO/IEC WD 25060　　ただし、25021 は、再編集中。

－未着手又は NWI レベル（4 件）

ISO/IEC 25041、ISO/IEC 25042、ISO/IEC 25043、ISO/IEC 25044

なお、ISO/IEC 25000 は、ソフトウェア製品の品質管理の基盤となる規格であるので、ISO 本部に無償公開（Free Availability）の申請をしている。

●JIS 原案の状況

次の 3 件の JIS 原案作成を行っている。

・TR X 0111-2（ISO/IEC TR 9126-2）ソフトウェア製品の品質　第 2 部：JIS X 0129-1 に対応した外部測定法　は規格調整分科会を終了し、2008 年第 1 回の JISC 審議にかける
・TR X 0111-3（ISO/IEC TR 9126-3）ソフトウェア製品の品質　第 3 部：JIS X 0129-1 に対応した内部測定法　は、2008 年 4 月に規格調整分科会で審議し、第 2 回の JISC 審議にかける予定。
・TR X 0111-4（ISO/IEC TR 9126-4）ソフトウェア製品の品質　第部：JIS X 0129-1 に対応した利用時の品質測定法　は、2008 年 4 月に規格調整分科会で審議し、第 2 回の JISC 審議にかける予定。

・JIS X 25000 SQuaRE - SQuaRE の手引き　は、2008 年 4 月に規格調整分科会で審議し、第 2 回の JISC 審議にかける予定。

3.2.5　今後の課題

規格は、エディタ及びコエディタが規格原案を作成し、それに対して各国の委員がコメントを提出し、規格を修正していくという過程を何度か行うことによって開発される。エディタ及びコエディタは、担当規格を国際規格として発行するために、年 2 回（1 週間づつ）の国際会議に出席し、規格原案を作成し、コメント審議、修正案作成するなどの作業を行わなければならない。規格を纏め上げるために発生する作業量は膨大なものになり、なかなか引き受け手がいないのが現状で、国内外ともに一部の方に作業が集中し、規格開発が当初の計画どおりに進んでいないのが実情である。

国内でも、こうした作業を委員会の席上だけで行うことは不可能であり、勤務時間内にこれらの作業を行うことが許されているのはごくわずかで、多くは自分の時間をつぶして作業をしているのが実情である。

しかしながら、規格開発において、その規格の内容をできるだけ日本の国内事情に沿ったものにしたい、開発好スケジュールを管理したい、全体として体系だった規格としたいなどの理由からエディタ又はコエディタとしてできるだけ参画するようにしている。

以上のように、規格開発の現場には、様々な問題点があるが、日本のソフトウェアが発展するためには、ソフトウェア製品の品質測定・評価に関する活動にできるだけ多くの企業・大学・研究機関などがもっと積極的に参画するように、広報することが最重要課題と思われる。

3.3 WG2：ソフトウェアプロセス評価委員会：SPA

3.3.1 背景

プロセス品質という面からみて、従来のソフトウェア開発プロセス及び運用プロセスが未熟な側面を持っており、プロセスとして問題があることは広く認識されてきた。そのため、ソフトウェアを活用する様々な分野からプロセスで使用する各種技術の開発の要望、プロセスの成熟度開発能力の状況を評価できるスキームの開発への要望があった。このことは、ソフトウェアの開発プロセス及び運用プロセスがプロセス品質の観点から技術的に停滞気味であり、プロセスの改善を図る必要があるという認識とも結びついていた。また、特定の要求事項を持ったプロジェクトにおいて、ある開発組織がそのソフトウェアの開発能力を持っているかどうかという、プロセス能力判定の問題も大きな問題であった。

米国においても、多分に1980年台の日本のソフトウェアエンジニアリング実践に触発され、さらに米国経済の再浮上への期待をこめてプロセス評価技術としてCMM（Capability Maturity Model）又はその前身が、開発されたことが最初である。1986年に、米空軍の要請により、カーネギーメロン大学ソフトウェア工学研究所において外注先選定手法の検討が開始され、後のCMMモデルの開発につながっていった。また、欧州又はカナダでも、米国での動きに合わせるように、いくつかのプロセス評価・改善のためのモデル及び手法が開発された。これらの開発が行われた直接的な動機は、①政府・国防関係のITシステム開発費が膨大に膨れ上がっていくことへの歯止め、②開発プロセス・業者選定プロセスの透明化、③開発プロセスへのソフトウェアエンジニアリングの適用、であった。

国際規格としてのソフトウェアプロセスアセスメントモデルの必要性は、“高品質のソフトウェア製品を開発するためには、その開発プロセスの成熟度を上げることが必要である。”という本来の目的からだけでなく、いくつかの複数のモデルの乱立の気配を背景に英国を中心として提起され、1991年7月に検討を開始し、1993年1月から正式にプロジェクトがスタートし、世界各国のモデルを参考にして開発された。そのモデルには、米国のCMMモデルのほか、英国国防省（MOD）のモデル、ヒューレットパッカード社のSQPAモデル、スコットランド企業庁のSTDモデル（現在のPPA法の前身）、BT社のSAMモデル（HEALTH CHECKモデルにつながる）、ESPRIT IIプロジェクトで開発されたBOOTSTRAPモデル、ベルカナダ社で開発されたSDCAMモデル（TRILLIUMモデルにつながる）などがある。また、当時のISO 9000及び経営品質に関わるマルコム・ボルドリッジ賞（The Malcolm Baldrige National Quality Award）の仕組みなども参照されたと思われる。

こうして統合されたソフトウェアプロセスに関連する規格は、何回かの試行（日本がアジア地区での情報センターを引き受け）により有効性の実証を行い、TRからISに提案されたものである。日本は全てのドキュメントのエディタ（又は、コエディタ）を引き受け、開発プロセスに関連する多くの規格・基準・提案との整合性を取りながら、規格作成を進めてきており、規格作成における日本の貢献は非常に大きいものがある。国際規格となったものは、随時JIS化を図っていく。

3.3.2 ソフトウェアプロセス評価規格

この規格は、認証制度に発展することを意図して開発したものではないが、規格の性格上、認証システムへと発展し、アセッサの教育カリキュラム・制度が整備されている。また、ドイツではCMMIと並んでこの規格に従った認証制度が運用されている。さらに、ヨーロッパを中心に自動車産業を対象とする“Automotive Spice”と呼ぶ認証制度も開始されている。この動きに触発され、その他の産業（航空宇宙、情報家電、金融など）でも認証制度を導入することが検討されているようである。

一方、国内でもアセッサ教育及びアセッサの認証制度の必要性が言われているが、表立った動きは見えていない。しかしながら、国内のソフトウェア関連企業がすぐの参照できるように、国際規格となっ

たものは、随時 JIS 化を図っていく。

委員会では原案の作成を支援してきており、5 部に編集しなおし、国際規格として発行されている。

①ISO/IEC 15504-1:2004 - Process Assessment - Part 1: Concepts and vocabulary

②ISO/IEC 15504-2:2003 - Process Assessment - Part 2: Performing an assessment

③ISO/IEC 15504-3:2004 - Process Assessment - Part 3: Guidance on performing an assessment

④ISO/IEC 15504-4:2004 - Process Assessment - Part 4: Guidance on using assessment results

⑤ISO/IEC 15504-5:2006 - Process Assessment - Part 5: An exemplar process assessment model

更に、次の 4 部が提案されており、エディタを受け持っている。現在 TR&PDTR となっている。

⑥ISO/IEC 15504-6 - Process Assessment - Part 6: An exemplar system life cycle process assessment model

⑦ISO/IEC 15504-7 - Process Assessment - Part 7: Assessment of organizational maturity

⑧ISO/IEC 15504-8 - Process Assessment - Part 8: An exemplar process assessment model for IT service management

⑨ISO/IEC 15504-9 - Process Assessment - Part 9: Capability target profiles

代表的な規格及び規格原案（目次、適用範囲など）について、附属資料に提示する。

また、プロセス評価規格は、ソフトウェアを使用しているすべての製品に影響を及ぼす規格であり、第 1 部から第 5 部の JIS 化を進めている。

3.3.3 活動概要

今年度の活動経緯は以下のとおりである。

第 1 回　2007 年 04 月 12 日（木）
第 2 回　2007 年 05 月 10 日（木）
第 3 回　2007 年 06 月 14 日（木）
第 4 回　2007 年 07 月 12 日（木）
第 5 回　2007 年 09 月 13 日（木）
第 6 回　2007 年 10 月 04 日（木）
第 7 回　2007 年 11 月 08 日（木）
第 8 回　2007 年 12 月 13 日（木）
第 9 回　2008 年 01 月 10 日（木）
第 10 回　2008 年 02 月 14 日（木）
第 11 回　2008 年 03 月 13 日（木）

3.3.4 活動成果

国際規格の作成支援結果としては、次のとおりである。

・ISO/IEC 15504-6 及び ISO/IEC 15504-7 は、2007 年には IS として発行される見通しである。

ソフトウェアプロセス評価規格の JIS 化の予定している。

①JIS X 0145-1 プロセスアセスメント－第 1 部：概念及び用語、2008 年 3 月 JIS 発行予定。

②JIS X 0145-2 プロセスアセスメント－第 2 部：アセスメントの実施、2008 年 3 月 JIS 発行予定。

③JIS X 0145-3 プロセスアセスメント－第 3 部：アセスメント実施の手引

④JIS X 0145-4 プロセスアセスメント－第 4 部：アセスメント結果利用の手引

⑤JIS X 0145-5 プロセスアセスメント－第 5 部：プロセスアセスメントモデルの事例

3.3.5 今後の課題

この委員会活動は、背景で記載したように、世界各国で提案されていたプロセスアセスメントモデルを統合することを目的とし、最終的に5部編成のISO/IEC 15504シリーズとしてまとめられた。この5部の規格では、プロセスアセスメントは“セルフアセスメント”を行うことを根本概念とし、アセッサの認定だけを行うことを理念とした。しかしながら、ソフトウェア開発企業がこぞってCMMなどの認定をうけることによって、ISO/IEC 15504 を基本とした、国際認証制度も検討され始め、ヨーロッパを中心に自動車産業を対象とする“Automotive Spice”と呼ぶ認証制度が開始された。

国内でも、これに対応して認証制度を実施することの必要性が一部でいわれているが、今のところ表立っての動きがないのが現状である。しかしながら、ソフトウェア開発における国際認証の動向を考えると国内でも認証制度の実現が必要かと思われ、その場合には委員会としての協力が不可欠と思われる。

また、国際の場では、第5部に引き続いて、第6部、第7部が提案された。ここまでは、従来からのSC7/WG10のスコープ内であると、了解された。その後第8部、第9部が提案されたが、これらは単にアセについて思案中である。

3.4 WG3：オンラインドキュメンテーション委員会：OLD

3.4.1 背景

ソフトウェア製品及びソフトウェアを使用した各種機器において、その使用方法を理解し、適切に使用するためには膨大な量のマニュアル（操作説明書、取扱説明書などを想定しているが、最近では開発者から提供されない場合も多くなってきている。）を理解することが、本来は、必要であると思われる。しかしながら、マニュアルの膨大さ又は今までの類似ソフトウェア又は機器の使用経験からマニュアルを読まずに使用していることがほとんどである。この場合、何か操作方法がわからない場合、まずその製品のヘルプ機能を使用して必要な情報を得ようとしたり、マニュアルの該当する（と思われる）部分だけを見て、操作方法を探し出そうとしている。しかしながら、必要とする操作方法がはっきりと見つけ出せることは、非常にまれで、いくつかの類似候補を発見できるだけである。極端な場合には、何をキーワードにして操作方法を探し出せばよいかもわからない場合も存在するものと思われる。その結果、ソフトウェアの提供する機能を十分に使用できず、さらには、利用者のソフトウェアへの不満が発生することになりがちである。

こうした現状に対処するため、利用者が実施したいことを入力することによってその操作方法をオンラインで表示できる仕組みの実現可能性を検討するとともに、国際委員会でもその必要性を提案してきた。実現可能性については、委員会主査の下に継続して実施されてきており、ほぼ所定の機能が実現可能であることがわかってきた。

この委員会では、上記の実現可能性の証明を基に、オンラインドキュメンテーション（ヘルプ）の国際規格の原案を作成し提案することを目標の一つとしている。ＮＷＩとして提案するために国際 SC7/WG2 委員会で検討した結果、規格とするには内容がまだ研究段階であり、実現の方法がイメージできないとの各国の代表から寄せられた意見に対しても、実現可能性を説明してきている。

今年度は、今までの議論を見直し、簡単な例ではあるけれどもプロトタイプを作成することによって実現性を確認しながら議論を進めるという方針を採った。いわゆるオンラインドキュメントを動的に生成することができること、ヘルプ、チュータ、ウイザードなどのドキュメントを一つのデータベースから生成できることが確認でき、具体的にどのように実装すればよいのかに重点を置いて調査研究を進めた。もちろんのことではあるが、この際に現実の商用アプリケーションにここで提案する手法を使えるかどうかを常に考慮した。

ユーザタスクの認識に基づく知的支援を行うための手法についても調査研究を行ってきたが、この点に関してはいまだ技術的に未成熟であり、今後さらに研究が必要であることから、規格化の対象からはとりあえず除き、ユーザからの明示的な要求に基づく動的なオンラインドキュメントの生成に焦点を絞って調査研究を進め、今年度中に規格原案のたたき台を完成し、ISO/IEC JTC1/SC7/WG2 国際委員会内で一応の合意を得ることを目標とした。また、この合意を得るために、できるだけ早くデモシステムを作成し、実際に動かして見せることによって技術的成熟度を明らかにするし、国際委員会における説得力を高めるという方針を立てた。

また、国際 SC7/WG2 委員会では、ソフトウェアシステムの文書化という視点で、ソフトウェア文書を体系化し、８つの規格とすることで優先度の高いものから見直しを進めている。

本委員会には、国内情報関連企業から委員が参加しており、実際のドキュメント作成の状況や現在使われているドキュメント作成手法についての情報を提供していただき、ここで提案する手法が現実のドキュメント生産にどのようなインパクトを与えるのかについても議論を進めることとした。

3.4.2　活動概要

今年度の活動経緯は以下のとおりである。

第1回　　2007年06月07日（木）
第2回　　2007年07月05日（木）
第3回　　2007年08月09日（木）
第4回　　2007年09月06日（木）
第5回　　2007年09月25日（火）
第6回　　2007年11月20日（火）
第7回　　2007年12月11日（火）
第8回　　2008年01月08日（火）
第9回　　2008年02月06日（火）

3.4.3　活動成果

国際規格の作成支援結果としては、次のとおりである。

・ISO/IEC FCD26514、 Software and systems engineering - User documentation requirements for documentation designers and developers
・NWIとして提案する文書の原案を作成した。原案を次に示す。

3.4.4　今後の課題

オンラインドキュメンテーション（ヘルプ）は、今まであまり注目されていなかった利用者環境についての提案で、その要求事項の掘り起こし及び取りまとめ、実現可能性の検討など一から開発検討した規格である。従来のソフトウェア製品に類似の機能はないといっても過言でなく、日本発の国際規格として開発していく必要がある。

しかしながら、利用者にとっては何が実現できるか明確に理解できず、ソフト開発者にとっても何を実装すれば実現できるのか説明できないのが現状で、この企画の理解者を増やすとともに、実モデルを使って実証してみることも必要と思われる。

附属資料

附属資料として、国際規格作成作業の成果物を、表題、目次、適用範囲などを参考のために掲載する。

附属資料 1 ISO/IEC 25001、 Software engineering - Software product Quality Requirements and Evaluation (SQuaRE) - Planning and management

附属資料 2 ISO/IEC 25010、 Software engineering - Software product Quality Requirements and Evaluation (SQuaRE) - Quality model

附属資料 3 ISO/IEC 25012、 Software engineering - Software product Quality Requirements and Evaluation (SQuaRE) - Data quality model

附属資料 4 ISO/IEC 25020、 Software engineering - Software product Quality Requirements and Evaluation (SQuaRE) - Measurement reference model and guide

附属資料 5 ISO/IEC TR 25021、 Software engineering - Software product Quality Requirements and Evaluation (SQuaRE) - Quality measure elements

附属資料 6 ISO/IEC 25030、 Software engineering - Software product Quality Requirements and Evaluation (SQuaRE) - Quality requirementsl

附属資料 7 ISO/IEC 25040、 Software engineering - Software product Quality Requirements and Evaluation (SQuaRE) - Evaluation reference model and guide

附属資料 8 ISO/IEC 25045、 Software engineering - Software product Quality Requirements and Evaluation (SQuaRE) - Evaluation module for recoverability

附属資料 9 ISO/IEC DTR 15504-6、 Information technology - Process assessment - Part 6: An exemplar system life cycle process assessment model

附属資料 10 ISO/IEC DTR 15504-7、 Information technology - Process assessment - Part 7: Assessment of organizational maturity

附属資料 11 NWI ISO/IEC 15504-8、 Information technology - Process assessment - Part 8: Capability target profile

附属資料 12 NWI Software and systems engineering - Reference structure for dynamic generation of online user documentation

附属資料1

INTERNATIONAL STANDARD

ISO/IEC 25001

First edition
2007-02-01

Software engineering — Software product Quality Requirements and Evaluation (SQuaRE) — Planning and management

Ingénierie du logiciel — Exigences de qualité et évaluation du produit logiciel (SQuaRE) — Planification et gestion

Reference number
ISO/IEC 25001:2007(E)

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of ISO/IEC 25001 may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 25001 makes a part of SQuaRE series of standards and was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information Technology*, Subcommittee SC 7, *Software and system engineering.*

SQuaRE series of standards consists of the following divisions under the general title *Software product Quality Requirements and Evaluation:*

— Quality Management Division (2500n),

— Quality Model Division (2501n),

— Quality Measurement Division (2502n),

— Quality Requirements Division (2503n), and

— Quality Evaluation Division (2504n).

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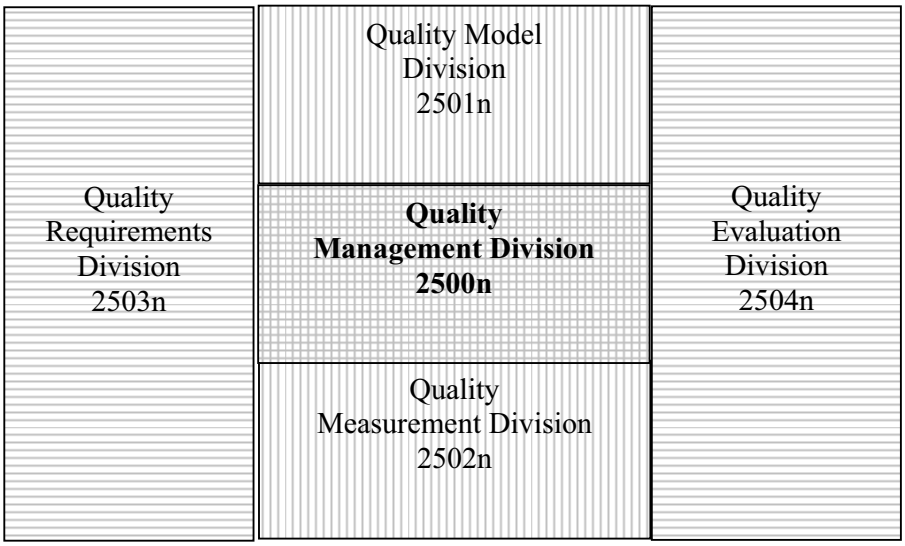
Introduction

ISO/IEC 25001 provides details about the planning and management requirements associated with software product quality requirements and evaluation.
While this standard is mainly concerned with product quality requirements and evaluation, wherever it is relevant the corresponding process requirements and evaluation activities are also discussed.

This standard aims to clarify the requirements which should be identified by the organization in order to ensure the success of specifying quality requirements and executing the evaluation.

This International Standard is intended to be used in conjunction with the other parts of the SQuaRE series (ISO/IEC 250nn) of standards, and with ISO/IEC 14598 and
ISO/IEC 9126-1 until superseded by the ISO/IEC 25000 series of standards.
This International Standard complies with the technical processes identified in ISO/IEC 15288 related to quality requirements definition and analysis.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Quality Management Division 2500n
Quality Evaluation Division 2504n
Quality Measurement Division 2502n

Figure 1 — Organization of SQuaRE series of standards

Figure 1 (quoted after ISO/IEC 25000) illustrates the organisation of the SQuaRE series representing families of standards, further called Divisions.

The Divisions within SQuaRE model are:

- **ISO/IEC 2500n — Quality Management Division**. The standards that form this division define all common models, terms and definitions referred further by all other standards from SQuaRE series. Referring paths (guidance through SQuaRE documents) and high level practical suggestions in applying proper standards to specific application cases offer help to all types of users. The division

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also provides requirements and guidance for an evaluation group which is responsible for the management of software product quality requirements specification and quality evaluation.

- **ISO/IEC 2501n — Quality Model Division**. The standard that forms this division presents a detailed quality model including characteristics for internal, external and quality in use. Furthermore, the internal and external software quality characteristics are decomposed into subcharacteristics. Practical guidance on the use of the quality model is also provided.

- **ISO/IEC 2502n — Quality Measurement Division**. The standards that form this division include a software product quality measurement reference model, mathematical definitions of quality measures, and practical guidance for their application. Presented measures apply to internal software quality, external software quality and quality in use. Quality measure elements forming foundations for the latter measures are defined and presented,

- **ISO/IEC 2503n — Quality Requirements Division**. The standard that forms this division helps specifying quality requirements. These quality requirements can be used in the process of quality requirements elicitation for a software product to be developed or as input for an evaluation process. The requirements definition process is mapped to technical processes defined in ISO/IEC 15288,

- **ISO/IEC 2504n — Quality Evaluation Division**. The standards that form this division provide requirements, recommendations and guidelines for software product evaluation, whether performed by evaluators, acquirers or developers. The support for documenting a measure as an Evaluation Module is also presented.

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Software engineering — Software product Quality Requirements and Evaluation (SQuaRE) — Planning and management

1 Scope

This International Standard provides requirements and recommendations for an organization responsible for implementing and managing the software product quality requirements specification and software quality evaluation activities through the provision of technology, tools, experiences and management skills.

The role of the evaluation group includes motivating people and training them for the requirements specification activities and the evaluation activities, preparing appropriate documents, identification or development of required methods, and responding to queries on relevant technologies.

Technology management is related to the planning and management of a software quality requirements specification and evaluation process, measures and tools. This includes the management of development, acquisition, standardization, control, transfer and feedback of requirements specification and evaluation technology experiences within the organisation.

The intended users of ISO/IEC 25001 are those responsible for:

- managing technologies used for requirements specification and evaluation execution,
- specifying software product quality requirements,
- supporting software product quality evaluation,
- managing software development organisations,

as well as those in a quality assurance function. It is also applicable to managers involved in other software related activities.

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附属資料2

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Software and Systems Engineering
Secretariat: CANADA (SCC)

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2007-07-09

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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ISO/IEC 25010 is a part of the SQuaRE series of standards and was prepared by Joint Technical Committee ISO/IEC JTC 1, *information technology*, Subcommittee SC 7, *Software and System Engineering*

The SQuaRE series of standards consists of the following divisions under the general title *Software product Quality Requirements and Evaluation:*

- ISO/IEC 2500n - Quality Management Division,
- ISO/IEC 2501n - Quality Model Division,
- ISO/IEC 2502n - Quality Measurement Division,
- ISO/IEC 2503n - Quality Requirements Division, and
- ISO/IEC 2504n - Quality Evaluation Division.

Introduction

Computers are being used in an increasingly wide variety of application areas, and their correct operation is often critical for business success and/or human safety. Developing or selecting high quality software products is therefore of prime importance. Comprehensive specification and evaluation of software product quality is a key factor in ensuring adequate quality. This can be achieved by defining appropriate quality characteristics, taking account of the purpose of usage of the software product. It is important that every relevant software product quality characteristic is specified and evaluated, whenever possible using validated or widely accepted measures.

ISO/IEC 9126 (1991): Software product evaluation - Quality characteristics and guidelines for their use, which was developed to support these needs, defined six quality characteristics and described a software product evaluation process model.

ISO/IEC 9126 (1991) was replaced in 2001 by two related multipart standards: ISO/IEC 9126 (Software product quality) and ISO/IEC 14598 (Software product evaluation).

This International Standard is a revision of ISO/IEC 9126-1: 2001, and incorporates the same software quality characteristics with some amendments.

- Security and interoperability are characteristics, rather than subcharacteristics of functionality. *[Editor's note: national bodies are invited to comment on the suggested subcharacteristics.]*

- The usability subcharacteristic *understandability* has been renamed as *appropriateness*, and *attractiveness* as *likability*. The subcharacteristic *helpfulness* has been added.

- Quality in use has been subdivided into *usability in use* and *safety in use* which incorporate the previous subcharacteristics, and has new subcharacteristics *context in use*, *security in use* and *adaptability in use*.

This International Standard is intended to be used in conjunction with the other parts of the SQuaRE series (ISO/IEC 25000 – ISO/IEC 25050) of standards, and with ISO/IEC 14598 until superseded by the ISO/IEC 25000 series of standards.

This International Standard complies with the technical processes defined in ISO/IEC 15288:2002 related to quality requirements definition and analysis.

Figure 1 (from ISO/IEC 25000) illustrates the organisation of the SQuaRE series representing families of standards, further called Divisions.

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- **ISO/IEC 2500n - Quality Management Division**. The standards that form this division define all common models, terms and definitions referred further by all other standards from SQuaRE series. Referring paths (guidance through SQuaRE documents) and high level practical suggestions in applying proper standards to specific application cases offer help to all types of users. The division provides also requirements and guidance for a supporting function which is responsible for the management of software product requirements specification and evaluation.

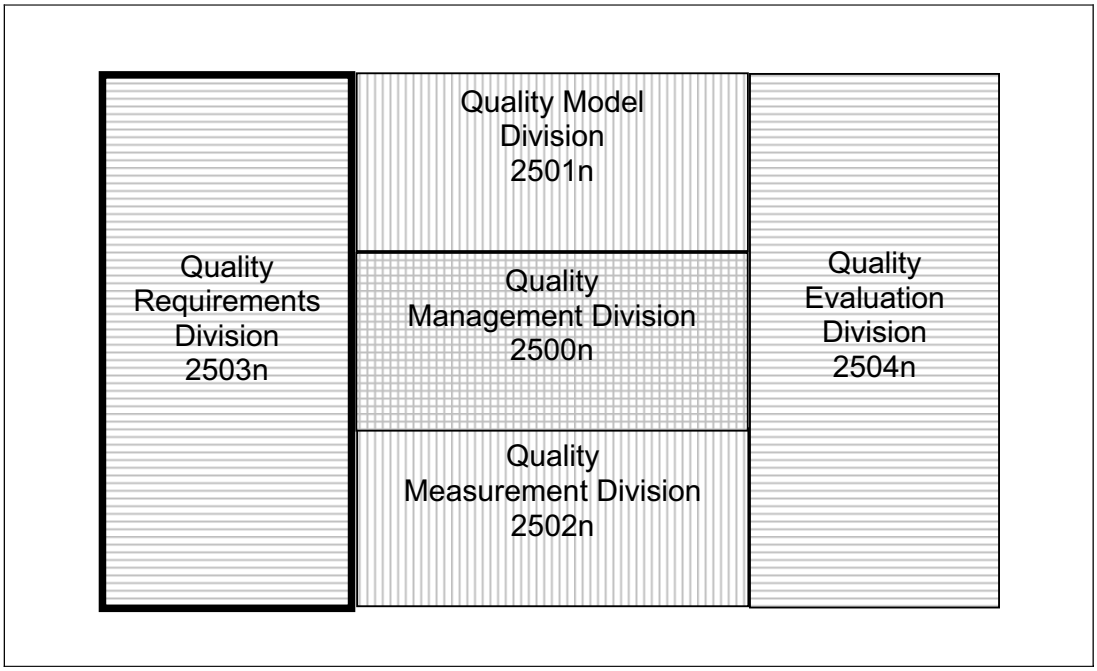
Quality Model Division 2501n
Quality Requirements Division 2503n
Quality Management Division 2500n
Quality Evaluation Division 2504n
Quality Measurement Division 2502n

Figure 1 – Organization of SQuaRE series of standards

- **ISO/IEC 2501n - Quality Model Division**. The standard that forms this division presents a detailed quality model including characteristics for internal, external and quality in use. Furthermore, the internal and external software quality characteristics are decomposed into subcharacteristics. Practical guidance on the use of the quality model is also provided.

- **ISO/IEC 2502n - Quality Measurement Division**. The standards that form this division include a software product quality measurement reference model, mathematical definitions of quality measures, and practical guidance for their application. Presented measures apply to internal software quality, external software quality and quality in use. Measurement primitives forming foundations for the latter measures are defined and presented.

- **ISO/IEC 2503n - Quality Requirements Division**. The standard that forms this division helps specifying quality requirements. These quality requirements can be used in the process of quality requirements elicitation for a software product to be developed or as input for an evaluation process. The requirements definition process is mapped to technical processes defined in ISO/IEC 15288 – Information Technology - Life Cycle Management - System Life Cycle Processes.

- **ISO/IEC 2504n - Quality Evaluation Division**. The standards that form this division provide requirements, recommendations and guidelines for software product evaluation, whether performed by evaluators, acquirers or developers. The support for documenting a measure as an Evaluation Module is also present.

ISO/IEC 25050 to 25099 are reserved to be used for SQuaRE extension standards and/or technical reports.

Software engineering - Software product Quality Requirements and Evaluation (SQuaRE) — Quality model

1 Scope

This International Standard describes a two-part model for software product quality: a) internal quality and external quality, and b) quality in use. The first part of the model specifies eight characteristics for internal and external quality, which are further subdivided into subcharacteristics. These subcharacteristics are manifested externally when the software is used as a part of a computer system, and are a result of internal software attributes. This International Standard does not elaborate the model for internal and external quality below the level of subcharacteristics.

The second part of the model specifies five quality in use characteristics. Quality in use is the combined effect for the user of the eight software product quality characteristics.

The characteristics defined are applicable to every kind of software. The characteristics and subcharacteristics provide consistent terminology for software product quality. They also provide a framework for specifying quality requirements for software, and making trade-offs between software product capabilities.

The quality model can be used to support specification and evaluation of software from different perspectives by those associated with acquisition, requirements, development, use, evaluation, support, maintenance, quality assurance and audit of software. It can for example be used by developers, acquirers, quality assurance staff and independent evaluators, particularly those responsible for specifying and evaluating software product quality. Examples of uses of the quality model defined in this International Standard are to:

- identify software requirements;
- validate the completeness of a requirements definition;
- identify software design objectives;
- identify software testing objectives;
- identify quality assurance criteria;
- identify acceptance criteria for a completed software product.

NOTE 1 This International Standard can be used in conjunction with ISO/IEC 15504 (which is concerned with the software process assessment) to provide:

- a framework for software product quality definition in the customer-supplier process;
- support for review, verification and validation, and a framework for quantitative quality evaluation, in the support process;
- support for setting organisational quality goals in the management process.

NOTE 2 This International Standard can be used in conjunction with ISO/IEC 12207 (which is concerned with the software lifecycle) to provide:

- a framework for software product quality requirements definition in the primary lifecycle process;
- support for review, verification and validation in supporting lifecycle processes.

NOTE 3 This International Standard can be used in conjunction with ISO 9001 (which is concerned with quality assurance processes) to provide:

- support for setting quality goals;
- support for design review, verification and validation.

附属資料3

ISO/IEC JTC1/SC7
Software and Systems Engineering
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ISO/IEC JTC1/SC7 3894

2008-01-15

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Foreword

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ISO/IEC 25012 is a part of the SQuaRE series of standards and was prepared by Joint Technical Committee ISO/IEC JTC 1, Information Technology, Subcommittee SC 7, Software and System Engineering.

SQuaRE series of standards consists of the following divisions under the general title Software Engineering, *Software Quality Requirements and Evaluation (SQuaRE):*

- Quality Management Division (ISO/IEC 2500n)
- Quality Model Division (ISO/IEC 2501n)
- Quality Measurement Division (ISO/IEC 2502n)
- Quality Requirements Division (ISO/IEC 2503n)
- Quality Evaluation Division (ISO/IEC 2504n).

Introduction

The quantity of data and information handled by computer systems is increasing worldwide; data quality is a key component of the quality and usefulness of information derived from that data, and most business processes depend on the quality of data.

A common prerequisite to all information technology projects is the quality of the data which are exchanged, processed and used between the computer systems and users and among computer systems.

Managing and enhancing the quality of data is important for a number of reasons:

- the acquisition of data from organizations of which the quality of data production process is unknown or weak
- the existence of defective data contributing to unsatisfactory information, unusable results and dissatisfied customers
- the dispersion of such data among various owners and users. Data captured in accordance with the workflow needs of a single organization often lacks a coherent and integrated vision which is necessary to ensure interoperability and co-operation
- the need of manage data which are not immediately re-usable because of semantic ambiguity or lack of consistency between such data and other existing co-related data
- the co-existence of legacy architecture and systems with distributed systems designed and realized at different times and with different standards
- the existence of information systems (such as the world wide web) where data changes frequently and integration is a special issue.

The data quality model defined in this International Standard aims to meet these needs; it could, for example, be used to:

- ensure data quality of existing data even regardless of software
- provide a basis useful to define organization's requirements in developing, acquiring or maintaining computer systems or information systems
- identify data quality requirements in data production, acquisition and evaluation processes, including security and interoperability aspects
- identify data quality assurance criteria, also useful for re-engineering, assessment and improvement of data
- help organizations to evaluate the compliance to laws and/or requirements

The detection of errors or inefficiencies due to data, give rise to enhancement and corrective interventions concerning:

- data (e.g. redesigning, parsing, cleansing, enriching, transforming, matching)
- human business process (e.g. user’s training to avoid errors in the data entry process)
- software (e.g. modifying source programs to implement consistency controls)
- hardware (e.g. upgrading a computer system to improve response time)

Data Quality can affect every component of a system, from the definition of system’s requirements, through in-process and final data quality evaluation; moreover, data quality affects the quality in use of the system.

The data quality model defined in this International Standard is intended to be used in

conjunction with the other parts of the SQuaRE series of standards, that are represented in figure 1 (from ISO/IEC 25000).

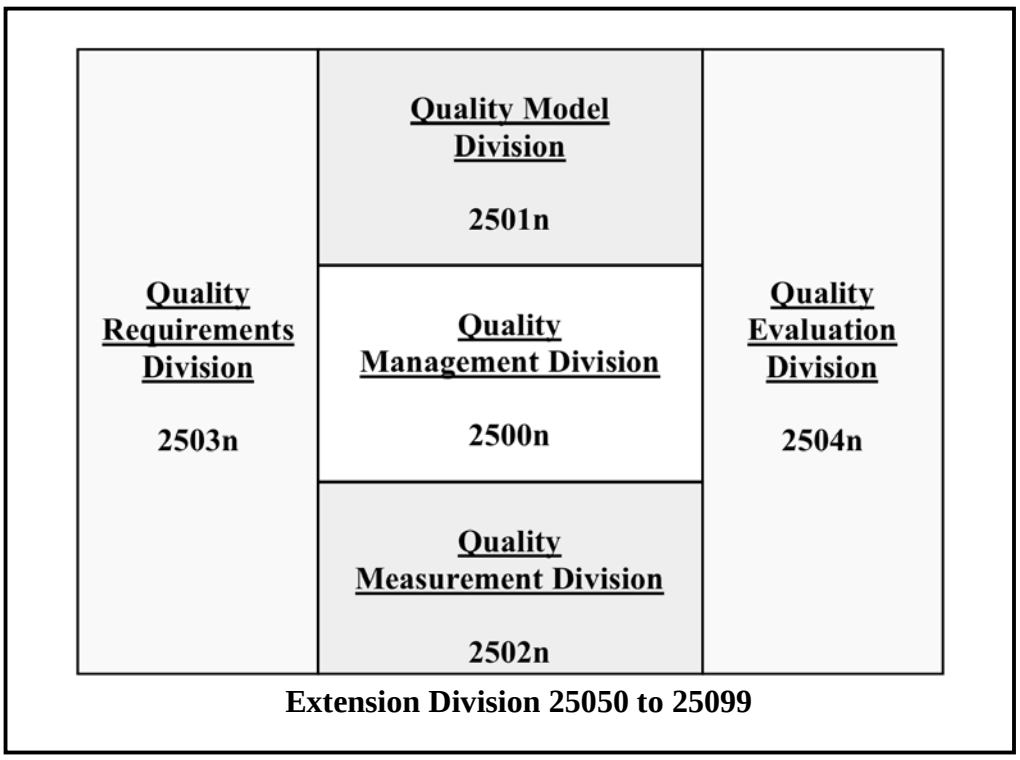

Figure 1 – Organization of SQuaRE series of standards

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- **ISO/IEC 2501n - Quality Model Division.** The standards that form this division present detailed quality models for software and data. Furthermore, in the software quality model the internal and external quality characteristics are decomposed into subcharacteristics. Practical guidance on the use of the quality models is also provided.
- **ISO/IEC 2502n - Quality Measurement Division**. The standards that form this division include a software product quality measurement reference model, mathematical definitions of quality measures, and practical guidance for their application. Presented measures apply to internal software quality, external software quality and quality in use. Quality Measure Elements forming foundations for the latter measures are defined and presented
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- **ISO/IEC 25050 to ISO/IEC 25099** are reserved for SQuaRE extension International Standards, Technical Specifications, Public Available Specifications(PAS) and/or Technical Reports (ISO/IEC 25051, 25062 are already published).

1 Scope

This International Standard defines a general data quality model to support organizations to manage data with the necessary quality characteristics to achieve their objectives.

The scope of the data quality model is data retained in a structured format within a computer system.

In Figure 2 the structure of a general system is displayed in a diagram: this can include information systems which in turn can include one or more computer systems.

The data quality model defined in this International Standard focuses on the quality of the data as part of a computer system and defines quality characteristics for target data used by the users and operators of the system; target data are those that the organisation decides to be analysed and validated through the model.

Non-target data are the data that the organisation considers out of the scope of the application of the data quality model.

EXAMPLE In a context of use represented by a business application that includes software and data, non-target data are system elements required to run the computer system, such as operating system data.

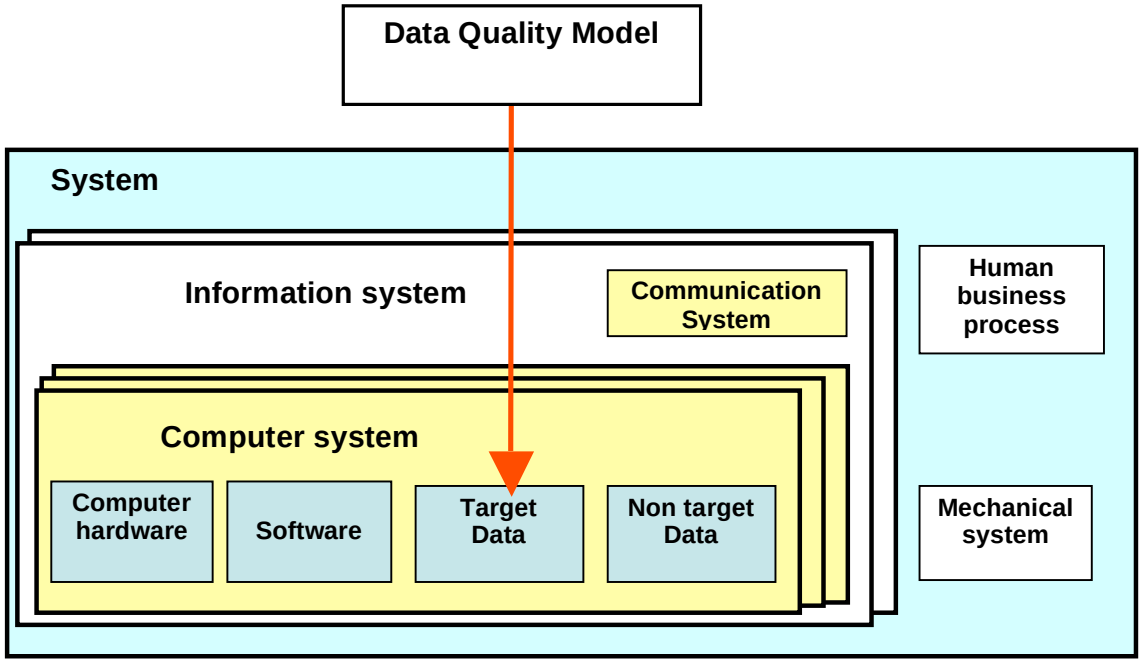

Figure 2 – Data quality model in SQuaRE Architecture

The purpose of the data quality model defined in this International Standard is to define and describe characteristics that may be used as a term of reference to define data quality requirements and data quality measures, and to establish criteria for the assessment and evaluation of the quality of the data managed by a computer system according to organization's objectives.

Three main situations can be highlighted:

a) when a new system needs to define the requirements to be allocated to data

b) when an existing system needs to assess data quality for data acquisition, integration, reengineering, migration, compliance purposes

c) to support data management and systems interoperability all through the data life cycle

In the first situation the data quality model defined in this International Standard aims to support the implementation of system's life cycle processes, such those defined, for example, in ISO/IEC 15288 - Systems and software engineering - System life cycle processes.

In the second situation data are analysed independently from other system's components, which may also be unknown or not available (for example, the software that created data may not be available when the system migrates to another architecture).

In the third situation data quality is required to monitor the data, taking into account that the data life cycle is often longer than software life cycle.

The data quality model defined in this International Standard takes into account all data types (e.g. character strings, date, numbers, images, sounds, etc), assigned data values and relationships between data (e.g. consistency between data in the same or in different entities); the scope does not include data produced by embedded devices or real time sensors that are not retained for further processing or historical purposes.

The definition of metadata is addressed by ISO/IEC 11179 series and is outside the scope of this International Standard, even if it refers to metadata to evaluate data quality.

Conceptual and logical data design are outside the scope of this data quality model, but benefit from consideration of the data quality characteristics.
Conformance of the data to the data design are within the scope of the data quality model.

The relationship and precedence of this data quality model relative to industry and domain specific data quality standards shall be identified by the application using this data quality model. Absent identification of precedence, this model is interpreted to be non-conflicting with any other data quality standard applied.

FINAL
DRAFT

INTERNATIONAL
STANDARD

**ISO/IEC
FDIS
25020**

ISO/IEC JTC **1**

Secretariat: **ANSI**

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2007-01-04

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2007-03-04

Software Engineering — Software quality requirements and evaluation (SQuaRE) — Quality measurement — Measurement reference model and guide

Ingénierie du logiciel — Exigences qualité et évaluation du logiciel (SQuaRE) — Mesurage de qualité — Modèle de référence de mesure et guide

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Reference number
ISO/IEC FDIS 25020:2007(E)

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Foreword

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— Quality Measurement Division (ISO/IEC 2502n),

— Quality Requirements Division (ISO/IEC 2503n), and

— Quality Evaluation Division (ISO/IEC 2504n)

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Introduction

The general goal of creating the SQuaRE series of International Standards is to move to a logically organized, enriched and unified series covering three complementary processes: requirements specification, measurement and evaluation. The purpose of the SQuaRE series of International Standards is to assist those developing and acquiring software products with the specification and evaluation of quality requirements. It establishes criteria for the specification of software product quality requirements and their evaluation. It includes a two-part quality model for aligning customer definitions of quality with characteristics of the software product. In addition, the series defines measures of software product quality characteristics that can be used by developers, acquirers and evaluators.

It has to be stressed that the SQuaRE series of International Standards is dedicated to software product quality only. The Quality Management Division of the SQuaRE series deals with software products, and is separate and distinct from the "Quality Management" of processes which is defined in the ISO 9000 family of International Standards.

The major benefits of the SQuaRE series over its predecessor standards include:

— the coordination of guidance on software product quality measurement and evaluation,

— guidance for the specification of software product quality requirements, and

— harmonization with ISO/IEC 15939 in the form of Quality Measurement Reference model presented in this International Standard.

The major differences between the SQuaRE series of International Standards and its predecessors, ISO/IEC 9126 and ISO/IEC 14598, are the:

— introduction of the new general reference model,

— introduction of dedicated and detailed guides for each division,

— introduction of Quality Measure Elements within the Quality Measurement Division,

— introduction of the Quality Requirements Division,

— incorporation and revision of the evaluation processes,

— introduction of guidance for practical use in the form of examples, and

— co-ordination and harmonization of content with ISO/IEC 15939.

SQuaRE consists of the following five divisions:

— Quality Management Division (ISO/IEC 2500n),

— Quality Model Division (ISO/IEC 2501n),

— Quality Measurement Division (ISO/IEC 2502n),

— Quality Requirements Division (ISO/IEC 2503n), and

— Quality Evaluation Division (ISO/IEC 2504n).

SQuaRE provides:

— terms and definitions,

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— reference models,

— a general guide,

— individual division guides, and

— standards for requirements specification, measurement and evaluation purposes.

SQuaRE includes International Standards and technical reports for a quality model and measures, as well as on quality requirements and evaluation. SQuaRE replaces current ISO/IEC 9126 series and ISO/IEC 14598 series.

This International Standard is intended to be used together with ISO/IEC 25010. It is strongly recommended that users refer to ISO/IEC 2500n, ISO/IEC 2501n, ISO/IEC 2503n, and ISO/IEC 2504n division of International Standards prior to using this International Standard and the associated measurement technical reports, particularly if the user is not familiar with the use of software measures for requirements specification and product evaluation. These International Standards discuss the planning and use of the software quality measures defined in the ISO/IEC 2502n series on software product quality measurement.

ISO/IEC 25010 will provide a model and defines terms for software product quality characteristics and how these characteristics are decomposed into subcharacteristics. It does not describe how any of these subcharacteristics could be measured. The Quality Measurement Division provides information and guidance about how to measure the characteristics and subcharacteristics of a quality model. This International Standard provides a reference model and guide for measuring the quality characteristics defined in ISO/IEC 2501n Quality Model Division (Figure 1). The associated standards and technical reports within the Quality Measurement Division describe measures of quality throughout the product life cycle.

ISO/IEC 25021 offers quality measure elements that can be used to construct software quality measures. Quality measure elements are the base and derived measures used to create measures of software product quality characteristics. Quality measure elements may measure a static representation of the software, the behaviour of the software, or the effects of the software when it is used.

ISO/IEC 25022, ISO/IEC 25023 and ISO/IEC 25024 will describe measures for the characteristics in the quality model. Internal measures characterize software product quality based upon static representations of the software, external measures characterize software product quality based upon the behaviour of the computer-based system including the software, and quality in use measures characterize software product quality based upon the effects of using the software in a specific context of use.

The measures in these technical reports should not be construed as an exhaustive or required set. Figure 2 depicts the relationship between this International Standard and the technical reports in the Quality Measurement Division. Developers, evaluators, quality managers, acquirers, suppliers, maintainers and other users of software may select measures from these technical reports for the measurement of quality characteristics of interest. In practice this may be with respect to defining requirements, evaluating software products, quality management and other purposes. Users may also modify the measures or use measures which are not included in those technical reports.

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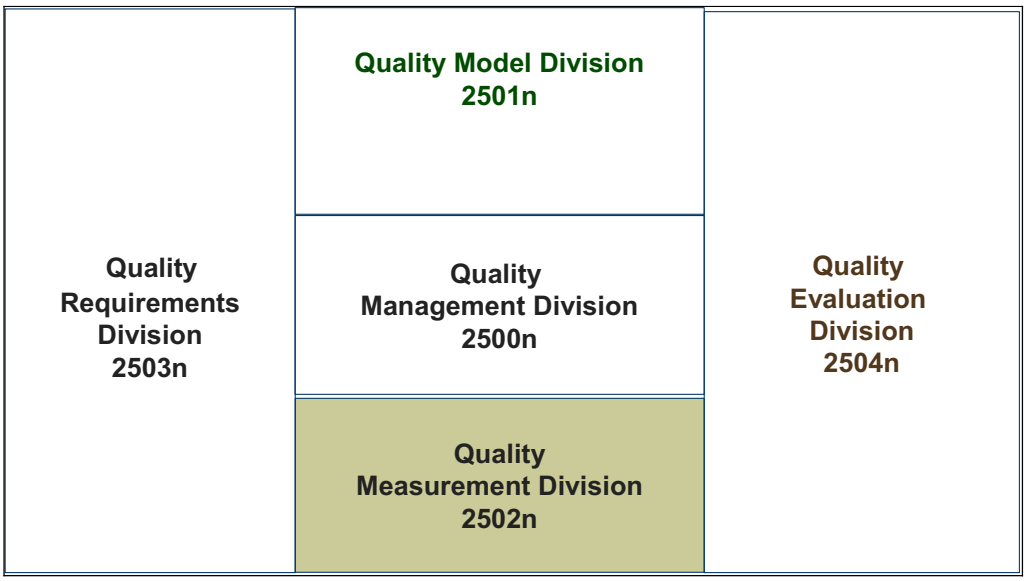

Figure 1 — Organization of the SQuaRE series of International Standards

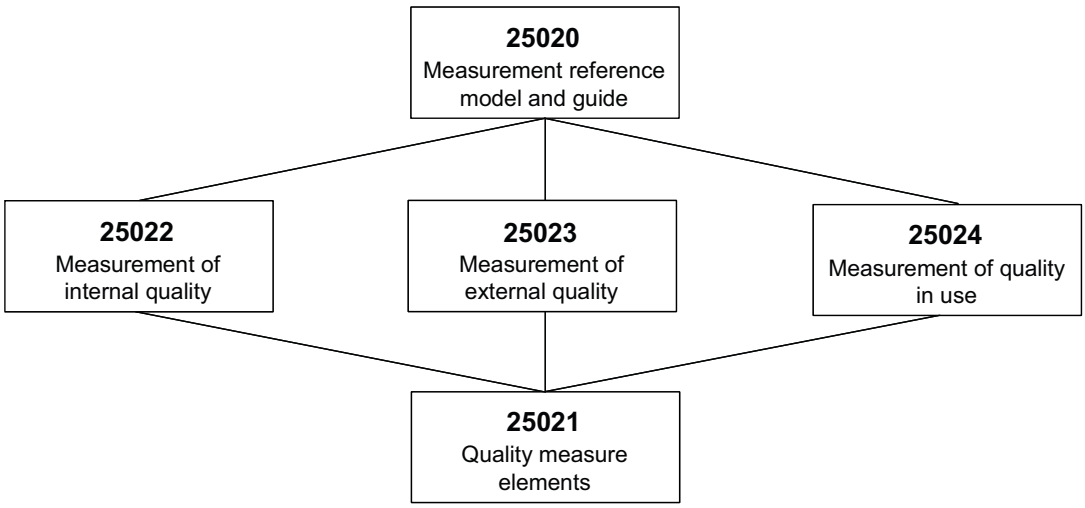

Figure 2 — Structure of the Quality Measurement division

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Software Engineering — Software quality requirements and evaluation (SQuaRE) — Quality measurement — Measurement reference model and guide

1 Scope

The scope of this International Standard is the selection and construction of software product quality measures, especially with respect to their use in conjunction with ISO/IEC 2503n. Software product quality requirements division and ISO/IEC 2504n. Software product quality evaluation division standards. It also provides information that assists users of the SQuaRE quality measurement technical reports (ISO/IEC 25021, ISO/IEC 25022, ISO/IEC 25023, and ISO/IEC 25024) to achieve the intended benefits of the above standards.

This International Standard also contains the following informative annexes (A through C) and Bibliography:

— Criteria for selecting software quality measures and quality measure elements

— Demonstrating predictive validity and assessing measurement reliability

— Example format for documenting software quality measures

— Bibliography

The SQuaRE series of International Standards is intended for, but not limited to, developers, acquirers and independent evaluators of software, particularly those responsible for defining software product quality requirements and for software product evaluation. It is recommended that users of SQuaRE use this International Standard as a guide to execute their software product quality measurement tasks.

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附属資料5

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Software and Systems Engineering
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2007-02-05

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

In exceptional circumstances, the joint technical committee may propose the publication of a Technical Report of one of the following types:

— type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;

— type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;

— type 3, when the joint technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC TR 25021, which is a Technical Report of type 2, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and System Engineering*.

SQuaRE series of standards consists of the following divisions under the general title *Software product Quality Requirements and Evaluation:*

— Quality Management Division,

— Quality Model Division,

— Quality Measurement Division,

— Quality Requirements Division, and

— Quality Evaluation Division.

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Introduction

The purpose of this Technical Report is to define an initial set of quality measure elements to be used throughout the software product life cycle for the purpose of Software Product Quality Requirement and Evaluation (SQuaRE). While the quality measure elements can be used for standalone measurement, their main purpose is to be used as the building blocks for other SQuaRE measures as described in ISO/IEC TR 9126-2, ISO/IEC TR 9126-3, ISO/IEC TR 9126-4 technical reports. The content of this Technical Report constitutes the link between the ISO/IEC 9126 series of standards and the subsequent SQuaRE series of standards (Figure 1).

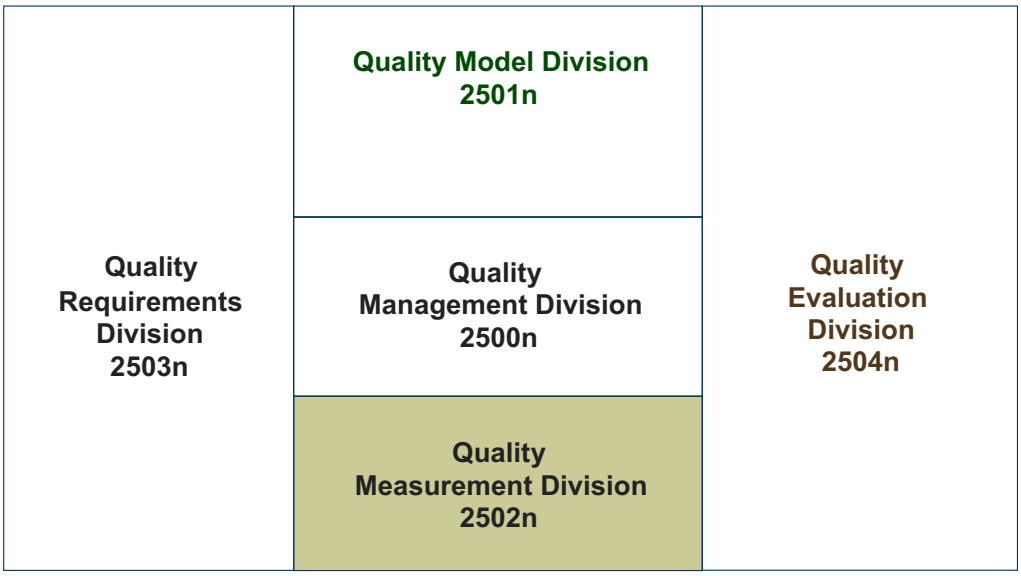

Figure 1 — Organization of SQuaRE series of standards

During the period of transition from a Technical Report to an International Standard, the intention of this Technical Report is to be only a source of support for the collection of quality measure elements. During this trial period, the applicability of this Technical Report and its content will be evaluated in the user environment. The support provided by this Technical Report for the measurement of software product quality is twofold: (a) assist in the selection of the required quality measure elements for a given quality measure, and (b) provide guidance for collecting the selected measurements.

The set of quality measures listed in this Technical Report arise from surveys involving several large commercial and academic institutions conducted during the following research projects:

— Quality Measure Validation Survey (Prague University of Economics research project GACR 201/06/0175 and Czech University of Life Sciences in Prague research projects MSM6046070904 and 2C06004),

— Conformity of Industrial Software to International Standards ES (Excellent Software) Mark (Korean Agency for Technology and Standards, Korea),

— Project for Development fund of MII (China Ministry of Information Industry): software engineering standardization.

NOTE This set does not contain quality measure elements for all ISO/IEC 9126-1 Quality Model subcharacteristics. Some subcharacteristics were omitted, because survey results did not find evidence of their use. It does not imply the ISO/IEC 9126-1 Quality Model should be changed, but rather new quality measures may need to be defined in the future.

Subsequently the quality measure elements necessary for measurement of above quality measures set have been identified and documented. These quality measure elements represent an initial set of measures which can be used during the construction of quality measures referenced in ISO/IEC TR 9126-2, ISO/IEC TR 9126-3 and

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ISO/IEC TR 9126-4 as well as other measures for other purposes. Quality measures described in the SQuaRE series (Figure 2) are derived from one or more quality measure elements described in this Technical Report. When evaluating a selected quality measure, the user should first review and evaluate the relevant quality measure element(s) listed in this Technical Report.

Some important benefits from using the measures in this Technical Report are:

— To improve measurement productivity and consistency which will minimize measurement effort - When using quality measures such as internal, external and quality in use, there is a possibility of duplicating the attribute measurement tasks, because they are usually performed as separate activities. However by identifying the set of quality measure elements that are uniquely required to derive all the quality measures for a given product, these measurements need to be performed only once at the attribute level. This approach will improve the productivity of the measurement processes,

— Usability (guidance, cross reference) - This Technical Report allows users to identify the possible indicators of quality (quality measures) that can be derived by measuring one or more measures from a selected set of quality measure elements, and thereby maximizing the benefits from the measurement process.

The quality measure elements are the common components of quality measures. The intention here is that users of this Technical Report will select measures from quality measure elements for the purpose of defining internal, external or quality in use measures. These are then used for quality requirements definition (ISO/IEC 25030), software products evaluation (ISO/IEC 2504n), quality assessment and other purposes. It is therefore strongly recommended to use this Technical Report and the other standards in the Quality Measurement Division together with the other relevant documents in the ISO/IEC 25000 series of standards.

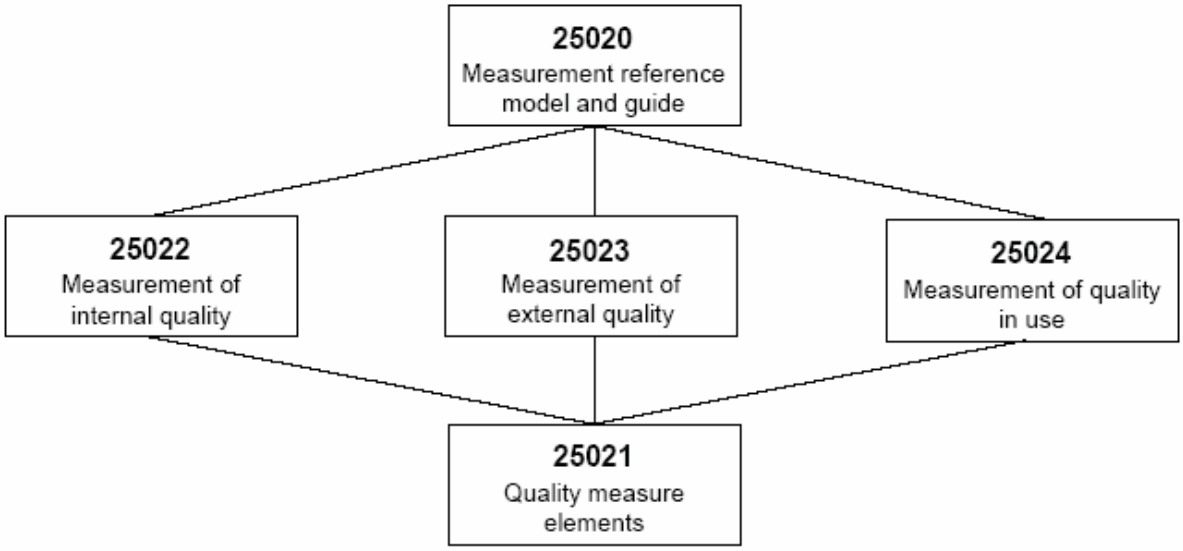

Figure 2 — Structure of the Quality Measurement Division

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Quality measure elements together with the other support documentation offered in this Technical Report, provide added value to the ISO/IEC 9126 Technical Reports and International Standards by making them more understandable to users by clearly defining the relevant quality measure elements (Figure 3). In this sense, this Technical Report acts effectively as the common link between the 9126 series and its follower, the SQuaRE series.

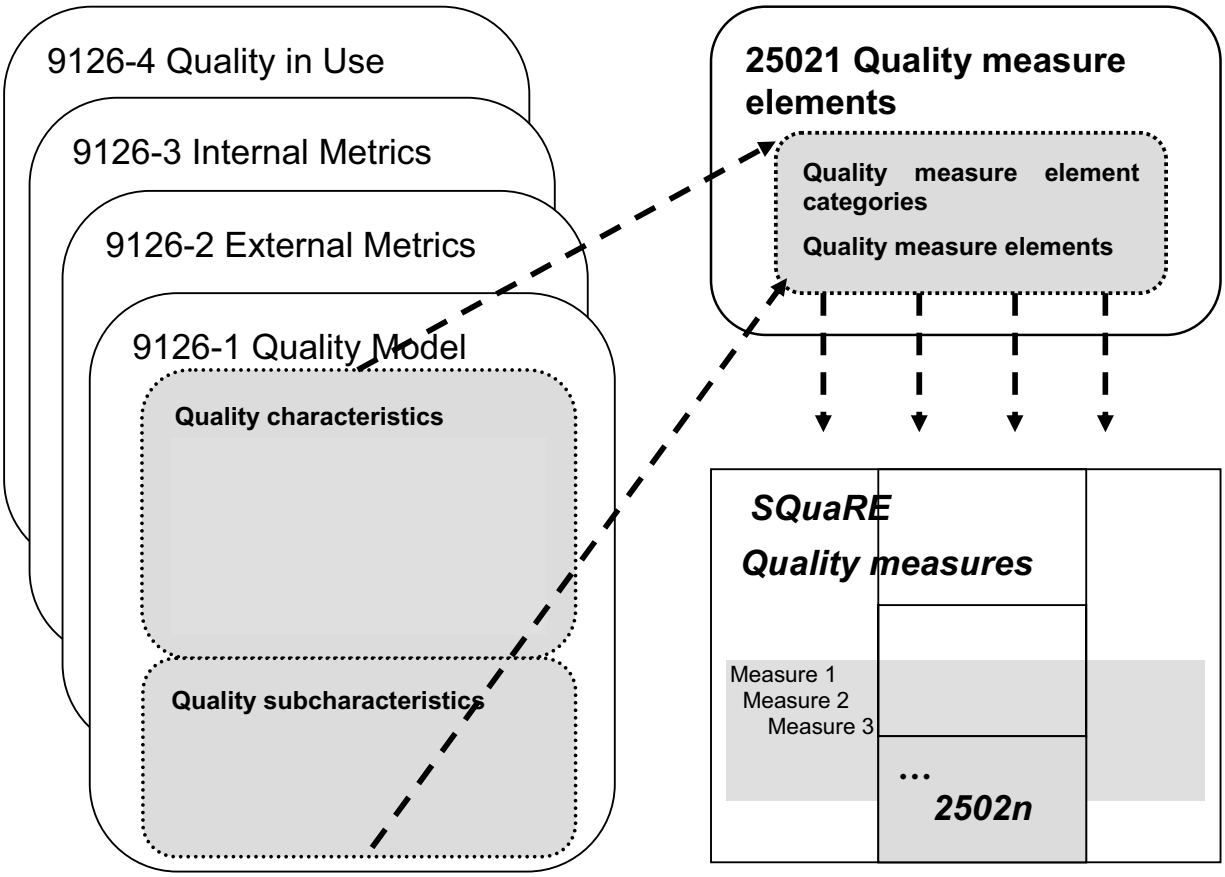

Figure 3 —The relationship of 25021-TR as a link between the 9126 series and the SQuaRE series of standards

1 Scope

This Technical Report specifies an initial set of quality measure elements in order to assist users of the ISO/IEC 9126 series of technical reports (ISO/IEC TR 9126-2, ISO/IEC TR 9126-3, ISO/IEC TR 9126-4) and users of SQuaRE series of quality measurement standards (ISO/IEC 25020, ISO/IEC 25022, ISO/IEC 25023 and ISO/IEC 25024) in the selection and use of the quality measures for software product quality evaluation and to select the entities to be measured in the software product lifecycle.

This Technical Report contains:

a) A description of the concept of quality measure elements,

b) Considerations for using quality measure elements,

c) A set of quality measure elements.

This Technical Report is intended for, but not limited to, developers, acquirers and independent evaluators of software product, particularly those responsible for defining software product quality requirements and for software product evaluation.

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附属資料6

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INTERNATIONAL
STANDARD

**ISO/IEC
FDIS
25030**

ISO/IEC JTC **1**

Secretariat: **ANSI**

Voting begins on:
2007-02-14

Voting terminates on:
2007-04-14

Software engineering — Software product Quality Requirements and Evaluation (SQuaRE) — Quality requirements

Ingénierie du logiciel — Exigences de qualité et évaluation du produit logiciel (SQuaRE) — Exigences de qualité

Please see the administrative notes on page iii

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Reference number
ISO/IEC 25030:2007(E)

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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ISO/IEC 25030 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

ISO/IEC 25030 is part of the SQuaRE series of standards. The SQuaRE series of standards consists of the following divisions under the general title *Software product Quality Requirements and Evaluation* (SQuaRE):

— ISO/IEC 2500n, *Quality Management Division*,

— ISO/IEC 2501n, *Quality Model Division*,

— ISO/IEC 2502n, *Quality Measurement Division*,

— ISO/IEC 2503n, *Quality Requirements Division*, and

— ISO/IEC 2504n, *Quality Evaluation Division*.

ISO/IEC 25050 to ISO/IEC 25099 are reserved to be used for SQuaRE extension standards and/or Technical Reports.

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Introduction

It is important to identify and specify software quality requirements as part of specifying the requirements for a software product. Software is usually part of a larger system. System requirements and software requirements are closely related and software requirements can therefore not be considered in isolation. This International Standard focuses on software quality requirements, but takes a system perspective. Software quality requirements can be categorized by use of a quality model, for example the quality model defined in ISO/IEC 9126-1 [ISO/IEC 25010]. Measures of attributes of these characteristics and their subcharacteristics can be used to specify software quality requirements and evaluate the quality of a software product.

Software quality requirements address important issues of quality for software products. Software product quality requirements are needed for:

— specification (including contractual agreement and call for tender);

— planning (including feasibility analysis and translation of external software quality requirements into internal software quality requirements);

— development (including early identification of potential quality problems during development); and

— evaluation (including objective assessment and certification of software product quality).

If software quality requirements are not stated clearly, they may be viewed, interpreted, implemented and evaluated differently by different people. This may result in software which is inconsistent with user expectations and of poor quality; users, clients and developers who are unsatisfied; and time and cost overruns to rework software.

This International Standard aims to improve the quality of software quality requirements. It does this by providing requirements and recommendations for quality requirements, and guidance for the processes used to define and analyse quality requirements.

Application of this International Standard should help ensure that software quality requirements are:

— in accordance with stakeholder needs;

— stated clearly and precisely;

— correct, complete, and consistent; and

— verifiable and measurable.

This International Standard is intended to be used in conjunction with the other parts of the SQuaRE series of Standards (ISO/IEC 25000 – ISO/IEC 25050), and with ISO/IEC 14598 and ISO/IEC 9126-1, until superseded by the ISO/IEC 25000 series.

This International Standard complies with the technical processes defined in ISO/IEC 15288:2002 related to quality requirements definition and analysis.

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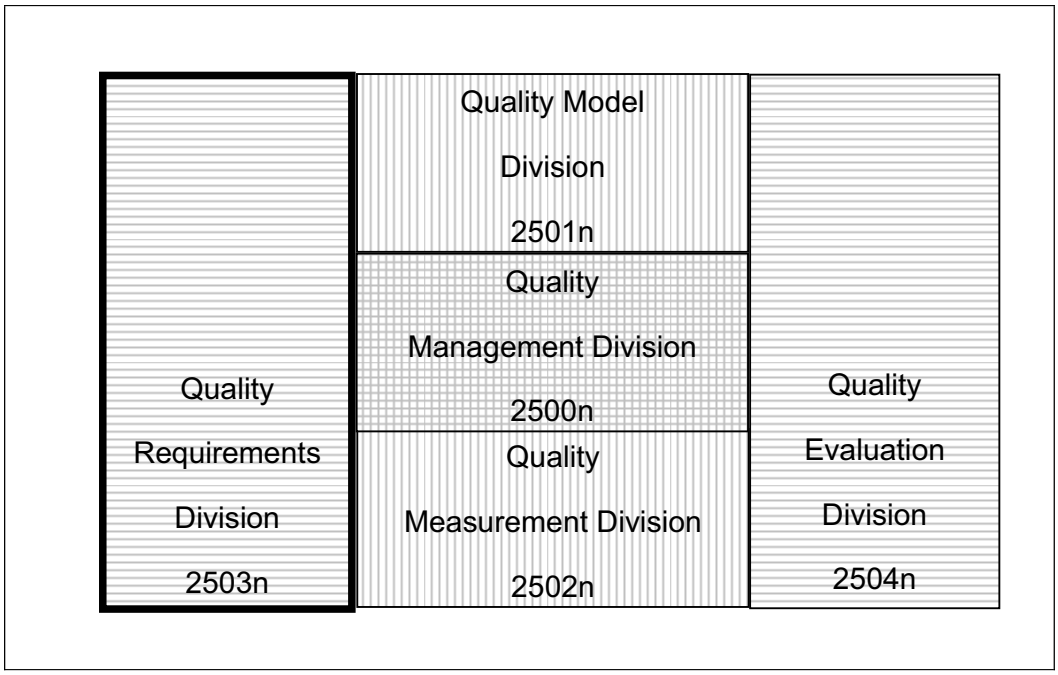

Figure 1 — Organization of SQuaRE series of International Standards

Figure 1 (copied from ISO/IEC 25000) illustrates the organization of the SQuaRE series representing families of International Standards, further called Divisions.

The Divisions within SQuaRE model are:

— **ISO/IEC 2500n, Quality Management Division**. The International Standards that form this division define all common models, terms and definitions referred to further by all other International Standards from the SQuaRE series. Referring paths (guidance through SQuaRE documents) and high level practical suggestions in applying proper International Standards to specific application cases offer help to all types of users. The division also provides requirements and guidance for a supporting function which is responsible for the management of software product requirements specification and evaluation.

— **ISO/IEC 2501n, Quality Model Division**. The International Standard that forms this division presents a detailed quality model including characteristics for internal, external and quality in use. Furthermore, the internal and external software quality characteristics are decomposed into subcharacteristics. Practical guidance on the use of the quality model is also provided.

— **ISO/IEC 2502n, Quality Measurement Division**. The International Standards that form this division include a software product quality measurement reference model, mathematical definitions of quality measures, and practical guidance for their application. Presented measures apply to internal software quality, external software quality and quality in use. Measurement primitives forming foundations for the latter measures are defined and presented.

— **ISO/IEC 2503n, Quality Requirements Division**. The International Standard that forms this division helps specify quality requirements. These quality requirements can be used in the process of quality requirements elicitation for a software product to be developed or as input for an evaluation process. The requirements definition process is mapped to technical processes defined in ISO/IEC 15288.

— **ISO/IEC 2504n, Quality Evaluation Division**. The International Standards that form this division provide requirements, recommendations and guidelines for software product evaluation, whether performed by evaluators, acquirers or developers. The support for documenting a measure as an Evaluation Module is also presented.

ISO/IEC 25050 to ISO/IEC 25099 are reserved to be used for SQuaRE extension International Standards and/or Technical Reports.

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Software engineering — Software product Quality Requirements and Evaluation (SQuaRE) — Quality requirements

1 Scope

This International Standard provides requirements and recommendations for the specification of software product quality requirements.

This International Standard applies to organizations in their role as both acquirers and suppliers.

The quality model in ISO/IEC 9126-1 [ISO/IEC 25010] is used to categorize software quality requirements and to provide a basis for quantifying the quality requirements in terms of software quality measures.

This International Standard complies with the technical processes defined in ISO/IEC 15288:2002, which are relevant for identification of stakeholder product quality needs and for analysis of software product quality requirements.

This International Standard does not cover specification of other requirements (such as functional requirements, process requirements, business requirements, etc.).

This International Standard does not prescribe specific software quality measures nor does it prescribe any specific development process.

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附属資料7

ISO/IEC JTC1/SC7
Software and Systems Engineering
Secretariat: CANADA (SCC)

ISO/IEC JTC1/SC7 3924

2008-01-21

Document Type	**CD ballot**
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Foreword

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ISO/IEC CD 25040 makes a part of SQuaRE series of standards and was prepared by Joint Technical Committee ISO/IEC JTC 1, *information technology*, Subcommittee SC 7, *Software and System Engineering*

SQuaRE series of standards consists of the following divisions under the general title *Software product Quality Requirements and Evaluation:*

- ISO/IEC 2500n - Quality Management Division,
- ISO/IEC 2501n - Quality Model Division,
- ISO/IEC 2502n - Quality Measurement Division,
- ISO/IEC 2503n - Quality Requirements Division, and
- ISO/IEC 2504n - Quality Evaluation Division.

Annex A provides specific issues to be followed when the evaluation process is applied by developers.

Annex B provides specific issues to be followed when the evaluation process is applied by acquirers.

Annex C provides specific issues to be followed when the evaluation process is applied within a third party independent evaluation.

Annex D provides an explanation on levels of evaluation, aspects to be considered when defining evaluation levels and suggestions on evaluation techniques to be applied according to the rank of evaluation level.

Annex E provides examples of evaluation methods.

Annex F provides a table showing relationships between some evaluation methods, possible costs rank and their effectiveness per software quality characteristics.

Annex G provides an example of application of the evaluation process (*to be included)*

Annex H contains bibliographic references.

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Introduction

The evaluation of software product quality is vital to both the acquisition and development of software that meets quality requirements. The relative importance of the various characteristics of software quality depends on the mission or objectives of the system of which it is a part; software products need to be evaluated to decide whether relevant quality characteristics meet the requirements of the system.

The essential parts of software quality evaluation are a quality model, the method of evaluation, software measurement, and supporting tools. To develop good software, quality requirements should be specified, the software quality assurance process should be planned, implemented and controlled, and both intermediate products and end products should be evaluated.

This document is part of SQuaRE series of standards and contains general requirements for specification and evaluation of software quality as well as clarifies the associated general concepts. It provides a framework for evaluating the quality of software products and states the requirements for methods of software product measurement and evaluation. Specific issues related to the developers, acquirers and third party independent evaluation are provided in annexes.

The general goal of creating the SQuaRE set of standards is to move to a logically organised, enriched and unified series covering two main processes: software quality requirements specification and software quality evaluation, supported by a software quality measurement process. The purpose of the SQuaRE set of standards is to assist those developing and acquiring software products with the specification and evaluation of quality requirements. It establishes criteria for the specification of software product quality requirements, their measurement, and evaluation. It includes a two-part quality model for aligning customer definitions of quality with attributes of the development process. In addition, the series provides recommended measures of software product quality attributes that can be used by developers, acquirers, and evaluators.

SQuaRE provides:

- Terms and definitions,
- Reference models,
- General guide,
- Individual division guides, and
- Standards for requirements specification, planning and management, measurement and evaluation purposes.

SQuaRE includes international standards on quality model and measures, as well as on quality requirements and evaluation.

SQuaRE replaces the current ISO/IEC 9126 series and the 14598 series.

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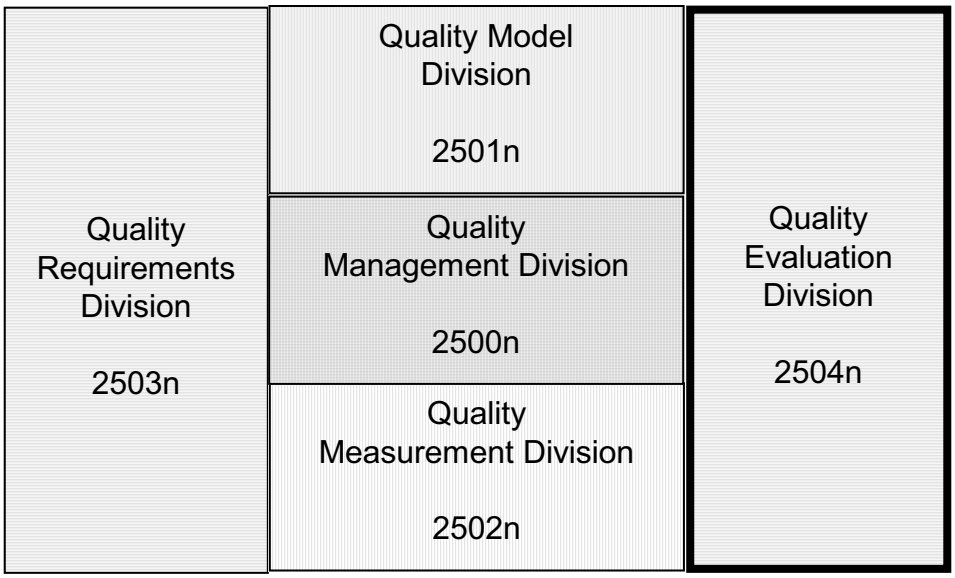

Figure 1 - Organisation of the SQuaRE series of standards

Figure 1 illustrates the organisation of the SQuaRE series representing families of standards, further called Divisions.

The Divisions within SQuaRE model are:

- **ISO/IEC 2500n - Quality Management Division**. The standards that form this division define all common models, terms and definitions referred further by all other standards from SQuaRE series. Referring paths (guidance through SQuaRE documents) and high level practical suggestions in applying proper standards to specific application cases offer help to all types of users. The division provides also requirements and guidance for a supporting function which is responsible for the management of software product requirements specification and evaluation.

- **ISO/IEC 2501n - Quality Model Division**. The standard that forms this division presents a detailed quality model including characteristics for internal, external, quality in use and data quality. Furthermore, the internal and external software quality characteristics are decomposed into subcharacteristics. Practical guidance on the use of the quality model is also provided.

- **ISO/IEC 2502n - Quality Measurement Division**. The standards that form this division include a software product quality measurement reference model, mathematical definitions of quality measures, and practical guidance for their application. Presented measures apply to internal software quality, external software quality and quality in use. Measurement primitives forming foundations for the latter measures are defined and presented,

- **ISO/IEC 2503n - Quality Requirements Division**. The standard that forms this division helps specifying quality requirements. These quality requirements can be used in the process of quality requirements elicitation for a software product to be developed or as input for an evaluation process. The requirements definition process is mapped to technical processes defined in ISO/IEC 15288 – Information Technology - Life Cycle Management - System Life Cycle Processes,

- **ISO/IEC 2504n - Quality Evaluation Division**. The standards that form this division provide requirements, recommendations and guidelines for software product evaluation, whether performed by third party independent evaluators, acquirers or developers. The support for documenting a measure as an Evaluation Module is also presented.

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ISO/IEC 25050 to ISO/IEC 25099 are reserved to be used for SQuaRE extension International Standards and/or Technical Reports.

This International Standard is part of the 2504n – Quality Evaluation Division that consists of the following International Standards:

- **ISO/IEC 25040 – Evaluation reference model and guide**: contains general requirements for specification and evaluation of software quality and clarifies the general concepts. Provides a process description for evaluating quality of software product and states the requirements for the application of this process. The evaluation process is the basis for software product quality evaluation for different purposes and approaches. Therefore the process can be used for the evaluation of quality in use, external software quality and internal software quality as well as can be applied to evaluate the quality of pre-developed software or custom software during its development process. The software product quality evaluation can be conducted by an acquirer, a developer organisation, a supplier or an independent third party evaluator. These three different approaches are presented as annexes that complement the main evaluation process providing issues to be followed according to each evaluation perspective.

- **ISO/IEC 25041 - Evaluation modules**: defines the structure and content of the documentation to be used to describe an Evaluation Module. These Evaluation Modules contain the specification of the quality model (i.e. characteristics, subcharacteristics and corresponding internal, external or quality in use measures), the associated data and information about the planned application of the model and the information about its actual application. Appropriate evaluation modules are selected for each evaluation. In some cases it may be necessary to develop new evaluation modules. Guidance for developing new evaluation modules is found in ISO/IEC 25041. This International Standard can also be used by organisations producing new evaluation modules;

ISO/IEC 25040 - Evaluation reference model and guide is a revised version and replaces the current ISO/IEC 14598-1 Software product evaluation – General overview and ISO/IEC 14598-3, 4 and 5. Also, ISO/IEC 25041 - Evaluation modules replaces current ISO/IEC 14598-2.

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Software engineering: Software product Quality Requirements and Evaluation (SQuaRE) – Evaluation reference model and guide

1 Scope

This document defines a reference model and general requirements for software product evaluation addressing also aspects of the evaluation process for developers, acquirers and independent third party evaluation. This part of 2504n division establishes the scope of each document of the division and the relationship among the documents as well as shows how each SQuaRE document should be used during the activities of the evaluation process.

ISO/IEC 25040 is intended for, but not limited to, developers, acquirers and independent third party evaluators of software products, particularly those responsible for software product evaluation. It is recommended that users of the 2504n standards use this International standard as a reference model when executing their tasks.

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附屬資料8

ISO/IEC JTC1/SC7
Software and Systems Engineering
Secretariat: CANADA (SCC)

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC CD 25040 makes a part of SQuaRE series of standards and was prepared by Joint Technical Committee ISO/IEC JTC 1, *information technology*, Subcommittee SC 7, *Software and System Engineering*

SQuaRE series of standards consists of the following divisions under the general title *Software product Quality Requirements and Evaluation:*

- ISO/IEC 2500n - Quality Management Division,
- ISO/IEC 2501n - Quality Model Division,
- ISO/IEC 2502n - Quality Measurement Division,
- ISO/IEC 2503n - Quality Requirements Division, and
- ISO/IEC 2504n - Quality Evaluation Division.

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Introduction

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ISO/IEC 25040 – Evaluation reference model and guide replace 14598-1 Software product evaluation - General overview.

ISO/IEC 25041 - Evaluation modules replace 14598-6 Software product evaluation – Documentation of Evaluation Modules

ISO/IEC 25042 - Evaluation modules replace 14598-3 Software product evaluation – Process for Developers

ISO/IEC 25043 - Evaluation modules replace 14598-4 Software product evaluation - Process for Acquirers

ISO/IEC 25044 - Evaluation modules replace 14598-5 Software product evaluation - Process for Evaluators

ISO/IEC 14598-2 Software Product Evaluation – Planning and Management is a part of ISO/IEC 250001

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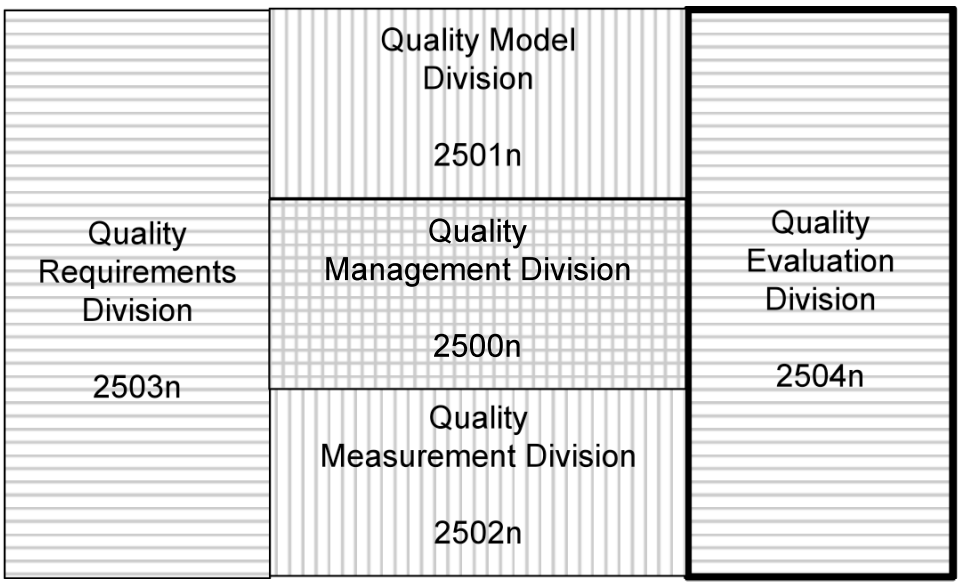

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This International Standard is part of the 2504n – Quality Evaluation Division that consists of the following International Standards (see Figure 2):

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- **ISO/IEC 25040 – Evaluation reference model and guide**: contains general requirements for specification and evaluation of software quality and clarifies the general concepts. Provides a process description for evaluating quality of software product and states the requirements for the application of this process. The evaluation process is the basis for software product quality evaluation for different purposes and approaches. Therefore the process can be used for the evaluation of quality in use, external software quality and internal software quality as well as can be applied to evaluate the quality of pre-developed software or custom software during its development process. The software product quality evaluation can be conducted by an acquirer, a developer organisation, a supplier or an independent third party evaluator;

- **ISO/IEC 25041 - Evaluation modules**: defines the structure and content of the documentation to be used to describe an Evaluation Module. These Evaluation Modules contain the specification of the quality model (i.e. characteristics, sub-characteristics and corresponding internal, external or quality in use measures), the associated data and information about the planned application of the model and the information about its actual application. Appropriate evaluation modules are selected for each evaluation. In some cases it may be necessary to develop new evaluation modules. Guidance for developing new evaluation modules is found in ISO/IEC 25041. This International Standard can also be used by organisations producing new evaluation modules;

- **ISO/IEC 25045 - Evaluation Module for Recoverability** provides the specification to evaluate the sub-characteristic of recoverability defined under the characteristic of reliability of the quality model. It determines the external quality measures of resiliency and autonomic recovery index when the information system composed of one or more software products' execution transactions is subjected to a series of disturbances. A disturbance could be an operational fault (e.g. an abrupt shutdown of an OS process that brings down a system) or an event (e.g. a significant increase of users to the system).

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Software engineering: Software product Quality Requirements and Evaluation (SQuaRE) – Evaluation Module for Recoverability

1 Scope

The ability of a software product and thereby a system to remain available or to recover within acceptable timeframe from disturbance has always been important since a down time often has economic and other consequences. The emphasis in recent years has extended to the autonomic ability of the software product and thereby a system to self-manage with minimal involvement by human operator. There are interests in the user domain and industry on how well a software product and thereby a system handles such disturbances in the way it detects analyses, adjusts or recovers.

This ISO/IEC 25045 Evaluation Module for Recoverability makes use of the disturbance injection methodology and a list of disturbances based on common categories of operational faults and events to evaluate the external quality measure of resiliency. A set of questions is defined for each disturbance to evaluate the external quality measure of autonomic recovery index by assessing how well the system detects, analyzes, and resolves the disturbance. This evaluation module is applicable to information systems executing transactions in a system supporting single or multiple concurrent users, where speedy recovery and ease of managing recovery is important to the acquirer..

1.1 Characteristics

Reliability – Recoverability – Resiliency, Autonomic recovery index

1.2 Level of evaluation

Level D as defined in ISO/IEC 14598 Part 5. This evaluation is intended for a system with executable products.

1.3 Technique

A disturbance injection methodology is a test methodology where disturbances are injected against the application and other components on the system while it is running a workload of interest to the acquirer. A disturbance injection methodology and a list of disturbances based on common categories of operational faults and events are used to evaluate the external quality measure of Resiliency. For each disturbance, the Resiliency of the system is calculated based on the ratio of the number of transactions that complete successfully while the system is under disturbance, over the number of transactions that complete successfully in a system that does not encounter the disturbance. A set of disturbances are defined under the following categories:

- Unexpected shutdown – e.g. abrupt OS shutdown, process shutdown, network shutdown
- Resource contention – e.g. CPU/memory/IO hogs, memory leak, DBMS run away query, DBMS deadlock, DBMS and queuing server storage exhaustion
- Loss of data – e.g. DBMS loss of data, DBMS loss of file, DBMS and queuing server loss of disk
- Load resolution – e.g. a moderate or significant increase of users or workload
- Restart failures – e.g. restart failure on OS and middleware server process

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A set of questions to assess how well the system detects, analyzes, and resolves the disturbance is defined for each disturbance to evaluate the external quality measure of autonomic recovery index. A score is calculated for each disturbance based on the answers to those questions.

The overall Resiliency and autonomic recovery index are calculated respectively as an average of those individual scores.

1.4 Applicability

This evaluation module is applicable to information system solution that involves a software product and other software components. The information system must have a workload that has a consistently reproducible performance result to properly assess the impact of disturbance and recovery. The evaluation module can be used in the following situations:

1. Evaluate as part of the system verification testing and is applicable for all types of application systems.

2. Evaluate against the test environment of a production system to gauge recoverability and identify weakness.

3. Evaluate the recoverability of different solutions proposed by vendors using a common workload.

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附属資料9

ISO/IEC JTC1/SC7
Software and Systems Engineering
Secretariat: CANADA (SCC)

ISO/IEC JTC1/SC7 /N3669

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

ISO/IEC TR 15504-6 was prepared by Technical Committee ISO/IEC/TC JTC1, *Information Technology*, Subcommittee SC 7, Software and Systems Engineering.

ISO/IEC TR 15504 consists of the following parts, under the general title *Information technology — Process assessment*:

— Part 1 - Concepts and Vocabulary

— Part 2 - Performing an Assessment

— Part 3 - Guidance on performing an assessment

— Part 4 - Guidance on use for process improvement and process capability determination

— Part 5 - An exemplar Process Assessment Model

— Part 6 - An exemplar system life cycle process assessment model

This Part of ISO/IEC 15504 is informative.

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Introduction

This part of ISO/IEC 15504 provides an example of a System Life Cycle Process Assessment Model for use in performing a conformant assessment in accordance with the requirements of ISO/IEC 15504-2.

An integral part of conducting an assessment is to use a process assessment model that is constructed for that purpose, is related to a process reference model and is conformant with ISO/IEC 15504-2, which sets out the minimum requirements for performing an assessment in order to ensure consistency and repeatability of the ratings.

A process reference model cannot be used alone as the basis for conducting consistent and reliable assessments of process capability because it requires greater detail to indicate process performance and capability. Therefore:

— the descriptions of process purpose and process outcomes provided by a process reference model need to be supported with a comprehensive set of indicators of process performance; and

— the capability levels and process attributes defined in ISO/IEC 15504-2 and its associated rating scale need to be supported with a set of indicators of process capability.

This additional detail describes a process reference model in terms of a process assessment model that can enable the assessment of consistent and repeatable ratings of process capability.

This Process Assessment Model contains a set of indicators to be considered when interpreting the intent of its Process Reference Model. These indicators may also be used when implementing a process improvement program or to help evaluate and select an assessment model, method, methodology or tools.

The Process Reference Model defined in ISO/IEC 15288: 2002 has been used as the basis for the Process Assessment Model in this part of ISO/IEC 15504.

As an exemplar, this Process Assessment Model embodies the core characteristics that could be expected of any Process Assessment Model consistent with ISO/IEC 15504-2. Nevertheless, use of this Process Assessment Model is not required to meet the requirements of ISO/IEC 15504; any other process assessment models meeting the requirements of ISO/IEC 15504-2 may be used in a conformant assessment.

This Part of ISO/IEC 15504 has a similar structure to Part 5. It may be used in conjunction with Part 5 for joint assessment of system life cycle processes and software life cycle processes.

This Part of ISO/IEC 15504 uses the classification structure of the information work products used in ISO 15289 *Systems and software engineering – Content of systems and software life cycle process information products (Documentation)* as the basis for the Generic Work Products.

Within this part of ISO/IEC 15504:

— clause 4 provides a detailed description of the structure and key components of a process assessment model, which includes two dimensions: a process dimension and a capability dimension. Assessment indicators are introduced in this clause;

— clause 5 addresses the process dimension. It uses process definitions from ISO/IEC 15288 to designate the Process Reference Model. The processes of the Process Reference Model are described in the Process Assessment Model in terms of purpose and outcomes and are grouped in four process categories. The Process Assessment Model expands the Process Reference Model process definitions by including a set of process performance indicators called base practices for each process. The Process Assessment Model also defines a second set of indicators of process

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performance by associating work products with each process. Clause 5 is also linked directly to Annex B, which defines the work product characteristics;

— clause 6 addresses the capability dimension. It duplicates the definitions of the capability levels and process attributes from ISO/IEC 15504-2, and expands each of the nine attributes through the inclusion of a set of generic practices. These generic practices belong to a set of indicators of process capability, in association with generic resource indicators, and generic work product indicators. Annex B is also linked directly to Clause 6 as it defines the work product characteristics;

— Annex A provides a statement of conformance of the Process Assessment Model to the requirements defined in ISO/IEC 15504-2;

— Annex B provides selected characteristics for typical work products to assist the assessor in evaluating the capability level of processes;

— Annex C contains style guides for defining base practices, work products and generic practices for adjusting the Process Assessment Model, and guidance explaining how to expand or adapt the model; and

— the Bibliography contains a list of informative references.

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Information technology — Process assessment — Part 6: An exemplar system life cycle process assessment model

1 Scope

This informative part of ISO/IEC 15504:

— defines an exemplar Process Assessment Model that meets the requirements of ISO/IEC 15504-2 and that supports the performance of an assessment by providing indicators for guidance on the interpretation of the process purposes and outcomes as defined in ISO/IEC 15288 and the process attributes as defined in ISO/IEC 15504-2;

— provides guidance, by example, on the definition, selection and use of assessment indicators.

A process assessment model comprises a set of indicators of process performance and process capability. The indicators are used as a basis for collecting the objective evidence that enables an assessor to assign ratings. The set of indicators included in this part of ISO/IEC 15504 is not intended to be an all-inclusive set nor is it intended to be applicable in its entirety. Subsets that are appropriate to the context and scope of the assessment should be selected, and possibly augmented with additional indicators (see Annex C).

The Process Assessment Model in this part of ISO/IEC 15504 is directed at assessment sponsors and competent assessors who wish to select a model, and associated documented process method, for assessment (for either capability determination or process improvement). Additionally it may be of use to developers of assessment models in the construction of their own model, by providing examples of good systems engineering and management practices.

Any process assessment model meeting the requirements defined in ISO/IEC 15504-2 concerning models for process assessment may be used for assessment. Different models and methods may be needed to address differing business needs. The assessment model in this part of ISO/IEC 15504 is provided as an exemplar of a model meeting all the requirements expressed in ISO/IEC 15504-2.

The scope of this Part of ISO/IEC 15504 is consistent with the scope of Part 5 of ISO/IEC 15504 in order to assist situations where assessment is being made of both system and software life cycle processes.

NOTE: **Copyright release for the Exemplar Process Assessment Model:** Users of this part of ISO/IEC 15504 may freely reproduce the detailed descriptions contained in the exemplar assessment model as part of any tool or other material to support the performance of process assessments, so that it can be used for its intended purpose.

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附属資料10

ISO/IEC JTC1/SC7
Software and Systems Engineering
Secretariat: CANADA (SCC)

ISO/IEC JTC1/SC7 /N3921

2008-01-20

Document Type	DTR
Title	DTR 15504-7 - Information technology — Process assessment — Part 7: Assessment of Organizational Maturity
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N/A

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

— type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts ;

— type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard ;

— type 3, where a technical committee has collected data of a different kind from that which is normally published as an International Standard (“state of the art”, for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/IEC TR 15504-7 was prepared by Technical Committee ISO/IEC/TC JTC1, *Information technology*, Subcommittee SC 7, *Software and Systems Engineering*.

ISO/IEC TR 15504 consists of the following parts, under the general title *Information technology — Process assessment*:

— Part 1 - Concepts and Vocabulary

— Part 2 - Performing an Assessment

— Part 3 - Guidance on performing an assessment

— Part 4 - Guidance on use for process improvement and process capability determination

— Part 5 - An exemplar Process Assessment Model

— Part 6 - An exemplar System Life Cycle Process Assessment Model

— Part 7: Assessment of Organizational Maturity

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N/A

Introduction

This part of ISO/IEC 15504 defines the conditions for an assessment of Organizational Maturity; it establishes a framework for determining overall Organizational Maturity, based upon assessed profiles of process capability, and defines the conditions under which such assessments are valid. Other parts of this International Standard define and provide guidance on the assessment of process capability.

ISO/IEC 15504-2 sets out the minimum requirements for performing a process assessment that ensure consistency and repeatability of the ratings. The requirements help to ensure that the assessment output is self-consistent and provides evidence to substantiate the ratings and to verify compliance with the requirements.

This part of ISO/IEC 15504 identifies a Measurement Framework for Organizational Maturity, and establishes requirements for:

a) constructing Organizational Maturity Models;

b) performing an assessment of Organizational Maturity;

c) verifying conformity of organizational maturity assessments.

As defined in this part of ISO/IEC 15504, Organizational Maturity is an expression of the extent to which an organization consistently implements processes within a defined scope that contributes to the achievement of its business goals (current or projected). The scope of reference for an assessment of Organizational Maturity is determined by the Organizational Maturity Model employed for the assessment. An Organizational Maturity Model is based upon one or more specified Process Assessment Models, and addresses the domains and contexts for use of the Process Reference Models from which the Process Assessment Models are derived.

The assessment of Organizational Maturity is undertaken through the performance of process assessment as specified in ISO/IEC 15504-2. Specific conditions are defined in this part of ISO/IEC 15504 relating to the process scope of the organizational maturity assessment, the organizational scope of the assessment (which has to be specified as representing the elements characterised by the Organizational Maturity rating), and the data collection strategy (which must ensure that the results of the assessment are representative of the organizational scope). On completion of the assessment, the set of process profiles established for the organization are converted into a rating of the level of Organizational Maturity based on the framework defined in this part of ISO/IEC 15504, as specified in the relevant Organizational Maturity Model.

This part of ISO/IEC 15504 also contains guidance on implementing the requirements for constructing an Organizational Maturity Model; on conducting assessments of Organizational Maturity; and on the application of Organizational Maturity ratings for process improvement and capability determination.

This part of ISO/IEC 15504 is being developed as a Technical Report Type 2, to enable experience in the use of the approach to assessment of Organizational Maturity to be gained. In future revisions of the Standard, it is likely that the content of this part will be distributed across the complete document set.

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Information technology — Process assessment — Part 7: Assessment of Organizational Maturity

1 Scope

This part of the International Standard addresses the expression of the results of assessment of processes in terms of the overall maturity of an organizational unit, and the application of the results of assessment of organizational maturity for process improvement and capability determination. It defines the conditions under which the results of conformant assessments of process capability can be translated into expressions of organizational maturity, ensuring that the results are objective, impartial, consistent, repeatable, comparable and representative of the assessed organizational units.

This part of the International Standard provides a structured approach for the assessment of organizational maturity for the following purposes:

— by or on behalf of an organization with the objective of understanding the status of its organizational maturity for process improvement;

— by or on behalf of an organization with the objective of determining the suitability of its organizational maturity for a particular requirement or class of requirements;

— by or on behalf of one organization with the objective of determining the suitability of another organization's processes for a particular contract or class of contracts.

NOTE Copyright release: Users of this part of ISO/IEC 15504 may freely reproduce relevant material as part of any Organizational Maturity Model, or as part of any demonstration of conformance with this international standard, so that it can be used for its intended purpose.

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附属資料11

ISO/IEC JTC1/SC7
Software and Systems Engineering
Secretariat: CANADA (SCC)

ISO/IEC JTC1/SC7 3910

2008-01-23

Document Type	NWI Proposal
Title	New Work Item Proposal - Information technology - Process Assessment: Capability Target Profiles
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Project	15504
Status	NP
References	
Action ID	ACT
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Start Date	2008-01-24
Distribution	SC7 AG, JTC 1
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No. of Pages	4
Note	Please vote using the ISO Electronic Balloting Facilities (Resolution 937)

Address reply to: ISO/IEC JTC1/SC7 Secretariat
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G3 New Work Item Proposal

January 2008

PROPOSAL FOR A NEW WORK ITEM

Date of presentation of proposal: **2008-01-19**	Proposer: **Switzerland (SNV)**
Secretariat: **SCC**	**ISO/IEC JTC 1 N** XXXX ISO/IEC JTC 1/SC 7 N3910

A proposal for a new work item shall be submitted to the secretariat of the ISO/IEC joint technical committee concerned with a copy to the ISO Central Secretariat.

Presentation of the proposal

Title Information technology - Process Assessment: Capability Target Profiles
Scope The goal of this NWIP is to specify the requirements and method for creating Target Profiles for Capability Determination purposes.
Purpose and justification ISO/IEC 15504 Part 4: Guidance on use for process improvement and process capability determination, describes the need for Target Profiles for capability determination purposes. It does not describe or specify how to create these Target Profiles or what they should contain. Within the ISO/IEC 15504 standard and referenced lifecycle standards, there are many possible Process Reference (and Assessment) Models specified for *various domains and applications* (i.e. the process dimension is well specified). We have specified the capability dimension into six capability levels valid for process assessment; however there is no specification for what capability level is needed for *various domains and applications.* This proposed new part would specify the requirements for creating valid Target Profiles and specify what constitutes a valid method for creating Target Profiles. This will cover domain of application, use of predictive means to specify and apply targets and community of use validation requirements. It will also provide representative formats for Target Profiles.
Programme of work If the proposed new work item is approved, which of the following document(s) is (are) expected to be developed? ____ a single International Standard ___ more than one International Standard (expected number: .....) ____ a multi-part International Standard consisting of ..... parts ____ an amendment to the following International Standard(s) _X__ a technical report, type ..... And which standard development track is recommended for the approved new work item?

__a. Default Timeframe __X_b. Accelerated Timeframe ____c. Extended Timeframe
Relevant documents to be considered ISO/IEC 15504. *Part 4: Guidance on use for process improvement and process capability determination*
Co-operation and liaison
Preparatory work offered with target date(s) Draft will available for next SC7/WG10 meeting if approved by start April 2008.
Signature: E. Hugentobler**,** SNV (Switzerland)
Will the service of a maintenance agency or registration authority be required? **No** - If yes, have you identified a potential candidate? - If yes, indicate name Are there any known requirements for coding? **No** -If yes, please specify on a separate page Does the proposed standard concern known patented items? **No** - If yes, please provide full information in an annex

Comments and recommendations of the JTC 1 or SC 7 Secretariat - attach a separate page as an annex, if necessary

Comments with respect to the proposal in general, and recommendations thereon: It is proposed to assign this new item to ISO/IEC JTC 1/SC 7/WG10

Voting on the proposal - Each P-member of the ISO/IEC joint technical committee has an obligation to vote within the time limits laid down (normally three months after the date of circulation).

Date of circulation: 2008-01-24	Closing date for voting: 2008-04-24	Signature of Secretary: W. Suryn

NEW WORK ITEM PROPOSAL - PROJECT ACCEPTANCE CRITERIA		
Criterion	**Validity**	**Explanation**
A. Business Requirement		
A.1 Market Requirement	Essential _X__ Desirable ___ Supportive ___	Currently there is much confusion about what constitutes valid capability targets for suppliers in various industries, e.g. automotive. Hence suppliers are confronted with varying customer demands that reduce or impair the aim to perform one capability determination assessment valid for multiple customers.
A.2 Regulatory Context	Essential _X__ Desirable ___ Supportive ___	With new safety standards that invoke or imply the need for process capability determination for software, Target Profiles can provide a means to relate safety standards to process assessment capability targets.
B. Related Work		
B.1 Completion/Maintenance of current standards	Yes ___ No__X_	
B.2 Commitment to other organisation	Yes ___ No_X__	
B.3 Other Source of standards	Yes ___ No_X__	
C. Technical Status		
C.1 Mature Technology	Yes _X__ No___	The basis for Target Profiles was originally specified in ISO/IEC TR 15504: Part 7. This has been retained in simplified form in ISO/IEC 15504: Part 4. The NWIP proposer has proven that a valid methodology exists for creating Target Profiles in work for the European Space Agency.
C.2 Prospective Technology	Yes __ No_ __	

C.3 Models/Tools	Yes _X__ No___	
D. Conformity Assessment and Interoperability		
D.1 Conformity Assessment	Yes _X__ No_ __	Would provide an informational guidance to ISO/IEC 15504: Part 4.
D.2 Interoperability	Yes ___ No__X_	
E. Adaptability to culture, Language, Human functioning and context of use		
E.1 Cultural and Linguistic Adaptability	Yes ___ No_X__	
E.2 Adaptability to Human Functioning and Context Use	Yes ___ No_X__	
F. Other Justification		

G3 New Work Item Proposal

March 2007

PROPOSAL FOR A NEW WORK ITEM

Date of presentation of proposal:	Proposer:
Secretariat: National Body	**ISO/IEC JTC 1 N** XXXX ISO/IEC JTC 1/SC XX N XXX

A proposal for a new work item shall be submitted to the secretariat of the ISO/IEC joint technical committee concerned with a copy to the ISO Central Secretariat.

Presentation of the proposal

Title Software and systems engineering -- Reference structure for dynamic generation of on-line user documentation
Scope (and field of application) This standard specifies a framework for dynamically generating help and/or tutor document for users. Actual help and/or tutor document is dynamically generated when the user refers necessary information, if a document developer registered elements that correspond to parts of final document and prepared scenarios.
Purpose and justification This standard specifies a framework for dynamic generation of user documentation and demonstrates an example implementation of this framework. By using this framework, a document developer may starts his/her work at the very beginning of the software development process and easily adapt update or specification change of the software. The collection of elements of document called fact base is described in XML and may be automatically created from tabular form specification. When a technical writer uses the target application via a scenario generator, his/her operation history is recorded as a sequence of used functions. An on-line help and/or tutor will be generated from these scenario and fact base depends on requested user skill level.
Programme of work If the proposed new work item is approved, which of the following document(s) is (are) expected to be developed? _X_ a single International Standard ___ more than one International Standard (expected number: .....) ____ a multi-part International Standard consisting of ..... parts ____ an amendment or amendments to the following International Standard(s) .....

____ a technical report , type ..... And which standard development track is recommended for the approved new work item? _X _a. Default Timeframe ____b. Accelerated Timeframe ____c. Extended Timeframe
Relevant documents to be considered
Co-operation and liaison
Preparatory work offered with target date(s) 2008-05-15
Signature:
Will the service of a maintenance agency or registration authority be required? ...No..... - If yes, have you identified a potential candidate? ..... - If yes, indicate name ..... Are there any known requirements for coding? ....No..... -If yes, please specify on a separate page Does the proposed standard concern known patented items? ...No..... - If yes, please provide full information in an annex Are there any known accessibility requirements and/or dependencies (see: http://www.jtc1access.org)?....No..... -If yes, please specify on a separate page Are there any known requirements for cultural and linguistic adaptability?...No..... -If yes, please specify on a separate page

Comments and recommendations of the JTC 1 or SC XX Secretariat - attach a separate page as an annex, if necessary

Comments with respect to the proposal in general, and recommendations thereon: It is proposed to assign this new item to JTC 1/SC 7

Voting on the proposal - Each P-member of the ISO/IEC joint technical committee has an obligation to vote within the time limits laid down (normally three months after the date of circulation).

Date of circulation: YYYY-MM-DD	Closing date for voting: YYYY-MM-DD	Signature of Secretary:

NEW WORK ITEM PROPOSAL -		

PROJECT ACCEPTANCE CRITERIA		
Criterion	**Validity**	**Explanation**
A. Business Requirement		
A.1 Market Requirement	Essential _X__ Desirable ___ Supportive ___	
B. Related Work		
B.1 Completion/Maintenance of current standards	Yes ___ No_X__	
B.2 Commitment to other organisation	Yes ___ No_X__	
B.3 Other Source of standards	Yes ___ No_X__	
C. Technical Status		
C.1 Mature Technology	Yes ___ No_X__	
C.2 Prospective Technology	Yes _X__ No___	
C.3 Models/Tools	Yes _X__ No___	
D. Conformity Assessment and Interoperability		
D.1 Conformity Assessment	Yes ___ No_X__	
D.2 Interoperability	Yes ___ No_X__	
E. Adaptability to Culture, Language, Human Functioning and Context of Use		
E.1 Cultural and Linguistic Adaptability	Yes _X__ No___	Translation is a target of this standard.
E.2 Adaptability to Human Functioning and Context of Use	Yes _X__ No___	This framework supports personalization of on-line document depending on user's

		skill.
F. Other Justification		

Notes to Proforma

A. Business Relevance. That which identifies market place relevance in terms of what problem is being solved and or need being addressed.

A.1 Market Requirement. When submitting a NP, the proposer shall identify the nature of the Market Requirement, assessing the extent to which it is essential, desirable or merely supportive of some other project.

A.2 Technical Regulation. If a Regulatory requirement is deemed to exist - e.g. for an area of public concern e.g. Information Security, Data protection, potentially leading to regulatory/public interest action based on the use of this voluntary international standard - the proposer shall identify this here.

B. Related Work. Aspects of the relationship of this NP to other areas of standardisation work shall be identified in this section.

B.1 Competition/Maintenance. If this NP is concerned with completing or maintaining existing standards, those concerned shall be identified here.

B.2 External Commitment. Groups, bodies, or for a external to JTC 1 to which a commitment has been made by JTC for Co-operation and or collaboration on this NP shall be identified here.

B.3 External Std/Specification. If other activities creating standards or specifications in this topic area are known to exist or be planned, and which might be available to JTC 1 as PAS, they shall be identified here.

C. Technical Status. The proposer shall indicate here an assessment of the extent to which the proposed standard is supported by current technology.

C.1 Mature Technology. Indicate here the extent to which the technology is reasonably stable and ripe for standardisation.

C.2 Prospective Technology. If the NP is anticipatory in nature based on expected or forecasted need, this shall be indicated here.

C.3 Models/Tools. If the NP relates to the creation of supportive reference models or tools, this shall be indicated here.

D. Conformity Assessment and Interoperability Any other aspects of background information justifying this NP shall be indicated here.

D.1 Indicate here if Conformity Assessment is relevant to your project. If so, indicate how it is addressed in your project plan.

D.2 Indicate here if Interoperability is relevant to your project. If so, indicate how it is addressed in your project plan

E. Adaptability to Culture, Language, Human Functioning and Context of Use
NOTE: The following criteria do not mandate any feature for adaptability to culture, language, human functioning or context of use. The following criteria require that if any features are provided for adapting to culture, language, human functioning or context of use by the new Work Item proposal, then the proposer is required to identify these features.

E.1 Cultural and Linguistic Adaptability. Indicate here if cultural and natural language adaptability is applicable to your project. If so, indicate how it is addressed in your project plan.

ISO/IEC TR 19764 (Guidelines, methodology, and reference criteria for cultural and linguistic adaptability in information technology products) now defines it in a simplified way:

- "ability for a product, while keeping its portability and interoperability properties, to:
- be internationalized, that is, be adapted to the special characteristics of natural languages and the commonly accepted rules for their se, or of cultures in a given geographical region;
- take into account the usual needs of any category of users, with the exception of specific needs related to physical constraints

Examples of characteristics of natural languages are: national characters and associated elements (such as hyphens, dashes, and punctuation marks), writing systems, correct transformation of characters, dates and measures, sorting and searching rules, coding of national entities (such as country and currency codes), presentation of telephone numbers and keyboard layouts. Related terms are localization, jurisdiction and multilingualism.

E.2 Adaptability to Human Functioning and Context of Use. Indicate here whether the proposed standard takes into account diverse human functioning and diverse contexts of use. If so, indicate how it is addressed in your project plan.
NOTE:
1. Human functioning is defined by the World Health Organization at http://www3.who.int/icf/beginners/bg.pdf as: << In ICF (International Classification of Functioning, Disability and Health), the term functioning refers to all body functions, activities and participation. >>
2. Content of use is defined in ISO 9241-11:1998 (Ergonomic requirements for office work with visual display terminals (VDTs) Part 11: Guidance on usability) as: << Users, tasks, equipment (hardware, software and materials), and the physical and societal

environments in which a product is used.>>
3. Guidance for Standard Developers to address the needs of older persons and persons with disabilities).

F. Other Justification Any other aspects of background information justifying this NP shall be indicated here.

経済産業省委託
平成 19 年度産業技術研究開発委託費
「情報分野の国際競争力強化の標準化調査研究」
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